

Fishery Data Series No. 99-46

Production of Coho Salmon from Slippery Creek, 1997–1998

by

Dean Beers

December 1999

Alaska Department of Fish and Game

Division of Sport Fish



Symbols and Abbreviations

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Weights and measures (metric)		General	Mathematics, statistics, fisheries	
centimeter	cm	All commonly accepted abbreviations.	e.g., Mr., Mrs., a.m., p.m., etc.	alternate hypothesis H_A
deciliter	dL	All commonly accepted professional titles.	e.g., Dr., Ph.D., R.N., etc.	base of natural logarithm e
gram	g	and	&	catch per unit effort CPUE
hectare	ha	at	@	coefficient of variation CV
kilogram	kg	Compass directions:		common test statistics F, t, χ^2 , etc.
kilometer	km	east	E	confidence interval C.I.
liter	L	north	N	correlation coefficient R (multiple)
meter	m	south	S	correlation coefficient r (simple)
metric ton	mt	west	W	covariance cov
milliliter	ml	Copyright	©	degree (angular or temperature) °
millimeter	mm	Corporate suffixes:		degrees of freedom df
		Company	Co.	divided by \div or / (in equations)
		Corporation	Corp.	equals =
		Incorporated	Inc.	expected value E
		Limited	Ltd.	fork length FL
		et alii (and other people)	et al.	greater than >
		et cetera (and so forth)	etc.	greater than or equal to ≥
		exempli gratia (for example)	e.g.,	harvest per unit effort HPUE
		id est (that is)	i.e.,	less than <
		latitude or longitude	lat. or long.	less than or equal to ≤
		monetary symbols (U.S.)	\$, ¢	logarithm (natural) ln
		months (tables and figures): first three letters	Jan., ..., Dec.	logarithm (base 10) log
		number (before a number)	# (e.g., #10)	logarithm (specify base) \log_2 , etc.
		pounds (after a number)	# (e.g., 10#)	mideye-to-fork MEF
		registered trademark	®	minute (angular) '
		trademark	™	multiplied by x
		United States (adjective)	U.S.	not significant NS
		United States of America (noun)	USA	null hypothesis H_0
		U.S. state and District of Columbia abbreviations	use two-letter abbreviations (e.g., AK, DC)	percent %
				probability P
				probability of a type I error (rejection of the null hypothesis when true) α
				probability of a type II error (acceptance of the null hypothesis when false) β
				second (angular) "
				standard deviation SD
				standard error SE
				standard length SL
				total length TL
				variance Var

FISHERY DATA SERIES NO. 99-46

**PRODUCTION OF COHO SALMON FROM SLIPPERY CREEK,
1997–1998**

by

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December 1999

This investigation was partially financed by the Federal Aid in Sport Fish Restoration Act
(16 U.S.C. 777-777K) under Project F-10-14, Job No. S-1-12.

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This document should be cited as:

Beers, Dean E. 1999. Production of coho salmon from Slippery Creek, 1997–1998. Alaska Department of Fish and Game, Fishery Data Series No. 99-46, Anchorage.

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ABSTRACT

Recovery of coded wire tags from adults in 1998 tagged as smolts in 1997 was used to estimate smolt abundance, harvest, exploitation rate, and production of coho salmon *Oncorhynchus kisutch* from Slippery Creek, on Kuiu Island in Southeast Alaska. From 21 April through 11 June 1997, a smolt trap was operated below the outlet to Slippery Lake. During this period 33,077 coho salmon smolt ≥ 70 mm fork length were tagged and released alive with valid tags with tag codes 04-31-20, 04-48-13, 04-43-34 and 04-49-38. In 1998, 615 adult coho salmon bearing coded wire tags of Slippery Creek origin were recovered in random sampling of marine fisheries, and correspond to an estimated harvest of 2,932 (SE = 114) fish in marine waters. Of this harvest, the troll fishery took an estimated 74.9%, net fisheries took 23.0%, and recreational fisheries 2.1%. The escapement of adults past the fish pass weir in 1998 was 632. Estimated run (escapement plus harvest) in 1998 for coho salmon originating from Slippery Creek is 3,564 (SE = 114); marine exploitation rate on this run is an estimated 82.3% (95% CI relative precision 10.3%). Estimated smolt abundance in 1997 from Slippery Creek was 43,544 (SE = 980), obtained by using a modified Petersen estimator, and marine survival rate of coho salmon smolt from Slippery Creek is an estimated 8.2 (95% CI relative precision 7.9 %).

Key words: coho salmon, *Oncorhynchus kisutch*, Slippery Creek, fish pass, harvest, troll fishery, drift gillnet fishery, recreational fishery, seine fishery, escapement, migratory timing, production, exploitation rate, marine survival

INTRODUCTION

Slippery Creek coho salmon *Oncorhynchus kisutch* are managed as a mixed stock; assessment of this particular stock is part of a regionwide effort at select locations throughout Southeast Alaska to gather information for management of mixed stock coho salmon fisheries. It is the only inside area stock assessment program for coho salmon between the Taku River (Juneau) and Hugh Smith Lake (Ketchikan) and is one of several new coho stock assessment programs Alaska Department of Fish and Game (ADF&G) is developing to provide timely data about run strength for inseason management. Since the smolt trap, adult fish pass, and crew living quarters were already designed and constructed, the cost effectiveness of this project is highly desirable.

In 1987 the U.S. Forest Service (USFS) constructed a fish pass at the lower end of the creek that allowed migrations into previously inaccessible habitat upstream (Figure 1). ADF&G and Northern Southeast Regional Aquaculture Association, Inc (NSRAA) enhanced the system for coho salmon with nearby wild stocks in 1987, and with Crystal Lake hatchery brood stock from 1988 to 1990. In 1997 the USFS operated a smolt

trap one-half mile below the lake outlet and placed coded wire tags (CWTs) in 33,077 coho smolts. In 1998, ADF&G, in cooperation with the Petersburg Ranger District of the USFS, operated a weir at the fish pass to count and sample the adult escapement.

Objectives of this study were to (1) estimate escapement, (2) ocean harvest, and (3) age, sex, and length composition of returning adults coho salmon in Slippery Creek in 1998.

METHODS

SMOLT CAPTURE AND CODED WIRE TAGGING

Salmon smolt emigrating from Slippery Creek were captured using a "wolf" style smolt trap from 21 April to 11 June 1997. The trap was designed and constructed by the USFS about one-half mile below the lake outlet (Figure 2). The trap is designed to funnel all downstream migrants over a large perforated stainless steel plate permanently embedded in the middle of the creek. The tilted perforated plate allows most of the water to pass freely and emigrant smolt are trapped above the plate; enough water flow is maintained to direct fish to a baffled live box and

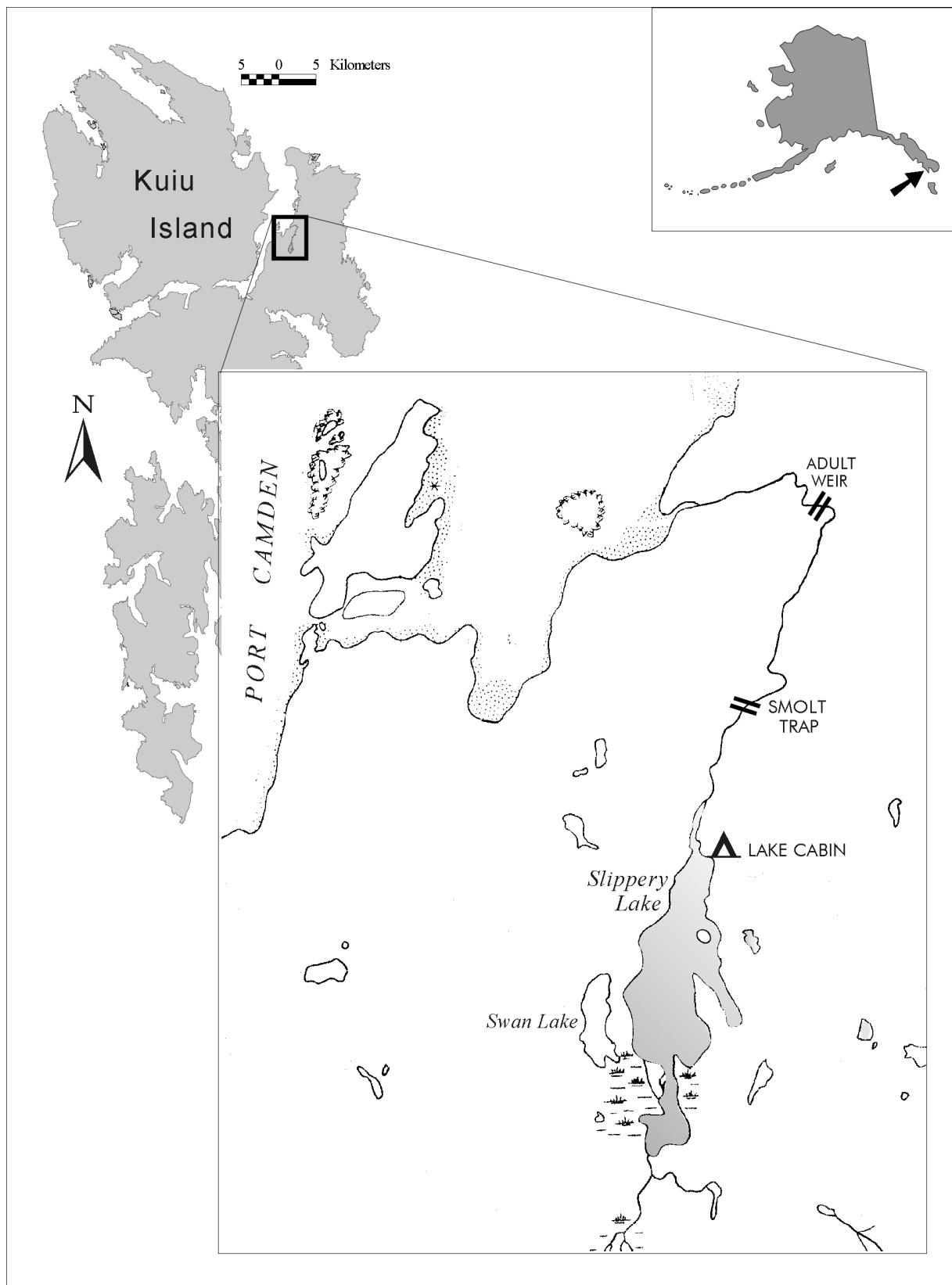


Figure 1.—Slippery Creek drainage on Kuiu Island, Southeast Alaska.

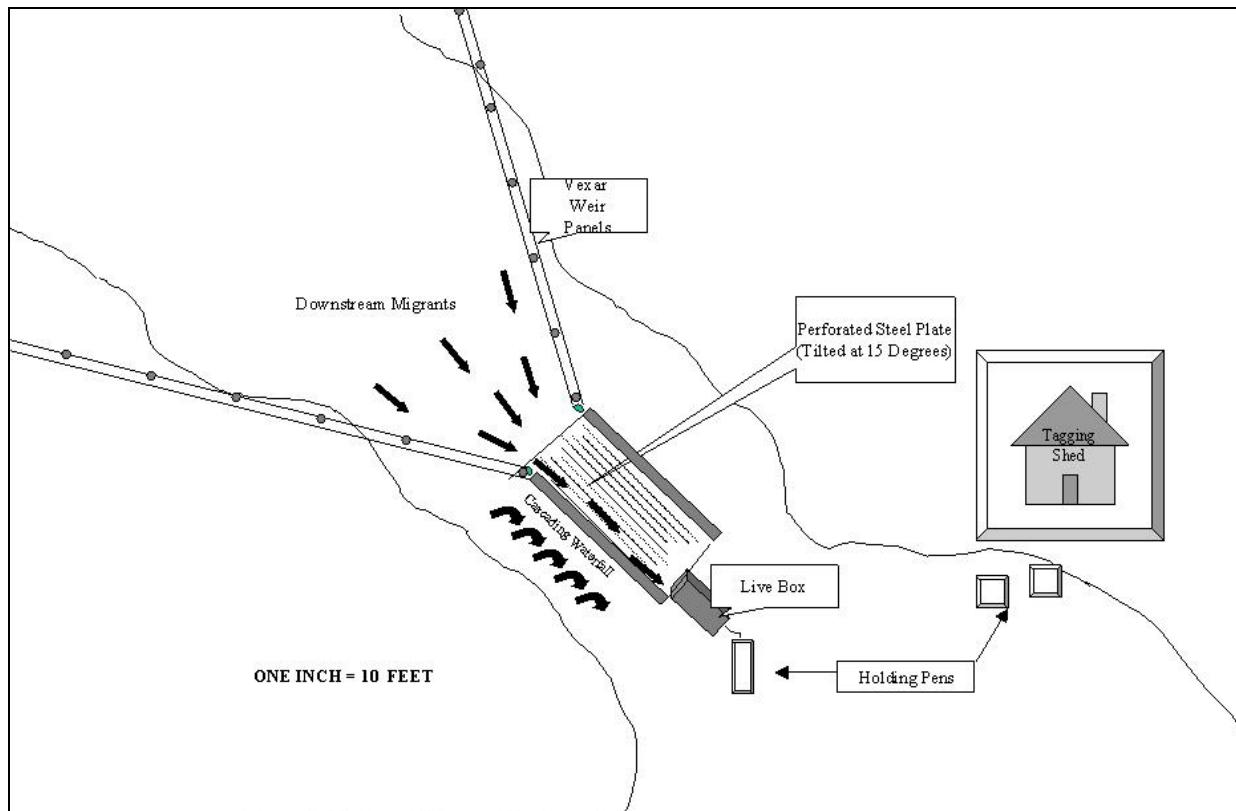


Figure 2.–Diagram of the Slippery Creek smolt trap design.

holding pen below the structure. While the trap has the potential to capture all coho smolts when in operation, occasional high water events allowed some fish to pass by unsampled in 1997.

Salmonid smolt were removed from the trap each morning, transported to holding pens next to the tagging shed, and processed each morning. Coho smolt were separated by inspection from other species of salmon, trout and Dolly Varden *Salvelinus malma*. Coho salmon smolt were identified and species were separated using a combination of external morphological characteristics (McConnell and Snyder 1972).

All live coho salmon smolt ≥ 70 mm FL were tranquilized in a buffered solution of tricainemethane sulfonate (MS 222). The solution was buffered with sodium bicarbonate until the pH was neutral. All fish were tagged with a coded

wire tag (CWT) and marked by excision of the adipose fin, following methods in Koerner (1977), and released (J. McDonell, USFS, Petersburg, personal communication).

One hundred coho salmon smolts from each day's tagging were checked 24 hours later for retention of CWTs and tagging mortality. The number of fish tagged, number of tagging-related mortalities, and number of fish that had shed their tags were compiled and recorded on *ADF&G CWT Tagging Summary and Release Information Forms* which were submitted to the Commercial Fisheries Division Tag Lab in Juneau when field work ended.

ESTIMATE OF SMOLT ABUNDANCE

The abundance of coho salmon smolt emigrating from Slippery Creek in 1997 was estimated using

Bailey's modified Petersen estimator for a closed population (Seber 1982; see Table 1 for definitions of notation):

$$\hat{N}_s = \frac{n_c(n_e + 1)}{(m_a + 1)} \quad (1a)$$

$$var[\hat{N}_s] = \frac{n_c^2(n_e + 1)(n_e - m_a)}{(m_a + 1)^2(m_a + 2)} \quad (1b)$$

ESTIMATE OF HARVEST

Harvest in 1998 of coho salmon originating from Slippery Creek was estimated by sampling catches in commercial and recreational fisheries and the escapement in Slippery Creek. Because several fisheries exploited coho salmon over several months in 1998, harvest was estimated over several strata, each a combination of time, area, and type of fishery. Statistics from the commercial troll fishery were stratified by fishing period and by fishing quadrant. Statistics from commercial net fisheries were stratified by week and by fishing district. Statistics from the recreational fishery were stratified by fortnight.

Estimates of harvest \hat{r}_i were calculated for each stratum, then summed across strata and across fisheries to obtain an estimate of the total \hat{T} :

$$\hat{T} = \sum_i \hat{r}_i \quad (2a)$$

$$v[\hat{T}] = \sum_i v[\hat{r}_i] \quad (2b)$$

Variance of the sum of estimates was estimated as the sum of variances across strata, because sampling was independent across strata and across fisheries.

A subset n_i of the catch in each stratum was counted and inspected to find recaptured fish. Of those a_i salmon in this sample without the adipose fin, heads were retrieved from a subset, marked, and sent to Juneau for dissection. Of the a'_i heads that arrived in Juneau, all were passed through a magnetometer to detect a CWT. Of the t_i tags detected, t'_i were successfully decoded under a microscope, after dissection of

which, m_{ci} had come from Slippery Creek. Oliver (1990) and Hubartt et al. (1997) present details of sampling commercial and recreational fisheries, respectively. The fraction of the return to Slippery Creek with tags (θ) was estimated as the fraction of the escapement sample of adults at the weir with valid, decoded CWTs ($\hat{\theta} = m_e / n_e$). Information from catch and field sampling programs was expanded to estimate harvest of coho salmon bound for Slippery Creek for each stratum, using the procedures in Bernard and Clark (1996). Variances for harvest in a stratum were calculated by using the appropriate large sample estimators (Table 2 in Bernard and Clark 1996) for the case where the function of fish carrying a coded wire tag is known with little to no error.

ESCAPEMENT

In 1998, from 1 September to 18 October, total immigration of adult coho salmon into Slippery Creek was determined by counting and marking each coho salmon past a 4-ft-wide picket weir at the head of a wooden debris deflector on the Slippery Creek fish pass. Adults were checked for a missing adipose fin and also checked for the presence of a coded wire tag, using a magnetometer to estimate tag loss. The stream and lake above the weir was also sampled (using sport gear) for unmarked fish passing prior to 1 September; fish landed without marks were marked and added to the escapement total.

Age, Length and Sex Composition

Proportions by age, length, or by sex in the weir samples were estimated by

$$\hat{p}_i = \frac{n_i}{n} \quad (3a)$$

$$V[\hat{p}_i] = \frac{\hat{p}_i(1 - \hat{p}_i)}{n - 1} \quad (3b)$$

A systematic sample of every fifth fish for age, length and sex at the weir ensured proportional sampling, which eliminated bias from any in-season changes in age, length, or sex composition. Estimates of mean length at age and its variance were calculated with standard procedures.

Table 1.—Notation used to describe parameters involved in estimators of harvest, escapement and smolt abundance of coho salmon from Slippery Creek. Coded wire tags are abbreviated as CWTs.

a_i	= Number of adults missing adipose fins in a sample from catch in a stratum
a'_i	= Number of heads that arrive at Juneau for dissection (subset of a_i) in a stratum
E	= Exploitation rate of adults in commercial and sport fisheries in 1998
m_{ci}	= Number of CWTs with the appropriate code(s) (subset of t'_i) in a stratum
m_a	= Number of adults sampled at Slippery Creek in 1998 with missing adipose fins
m_e	= Number of adults sampled at Slippery Creek in 1998 with detected tags (a subset of m_a)
n	= Number of adults sampled
n_i	= Number of adults caught in a stratum inspected for missing adipose fins
n_c	= Number of smolt tagged in 1997
n_e	= Number of adults sampled in 1998 to estimate θ
N	= Total catch
N_e	= Number of adults in escapement to Slippery Creek in 1998
N_R	= Estimate of total adult run size in 1998
N_s	= Number of smolts emigrating from Slippery Creek in 1997
p_i	= Fraction of catch with a CWT from a stratum in 1998
r_i	= Harvest in 1998 of coho salmon originating from Slippery Creek in a stratum
S	= Survival rate from smolts in 1997 to adults in 1998
t_i	= Number of heads with tags detected magnetically (subset of a'_i) in a stratum
t'_i	= Number of CWTs found through dissection and decoded (subset of t_i) in a stratum
T	= Number of adults harvested in all strata and all fisheries in 1998
θ	= Fraction of the stock tagged with valid decoded CWTs

ESTIMATES OF RUN SIZE, RATE OF EXPLOITATION, AND MARINE SURVIVAL

Estimates of total run size (harvest plus escapement) of coho salmon returning to the Slippery Creek above the weir in 1998 is the sum of the estimated harvest (T) and escapement (N_e).

$$\hat{N}_R = \hat{T} + \hat{N}_e \quad (4a)$$

$$var[\hat{N}_R] = var[\hat{T}] + var[\hat{N}_e] \quad (4b)$$

The estimated exploitation rate by sport and commercial fisheries was calculated as

$$\hat{E} = \frac{\hat{T}}{\hat{N}_R} \quad (5a)$$

$$v[\hat{E}] \approx \hat{E}^2 \left[\frac{v[\hat{T}]\hat{N}_e^2}{\hat{N}_R^4} + \frac{v[\hat{N}_e]\hat{T}^2}{\hat{N}_R^4} \right] \quad (5b)$$

The variance in equation (5b) is an approximation derived using the delta method (Seber 1982). The estimated survival rate of smolts to adults was calculated as

$$\hat{S} = \frac{\hat{N}_R}{\hat{N}_s} \quad (6a)$$

$$var[\hat{S}] \approx \hat{S}^2 \left[\frac{var[\hat{N}_R]}{\hat{N}_R^2} + \frac{var[\hat{N}_s]}{\hat{N}_s^2} \right] \quad (6b)$$

The variance in equation (6b) is also an approximation derived by the delta method (Seber 1982).

RESULTS

SMOLT TAGGING IN 1997

From 21 April through 11 June 1997 at the smolt trap, 35,333 coho salmon smolt ≥ 70 mm FL were captured (Table 2). We released 1,551 smolt untagged, 220 died after tagging, and 485 were estimated to have shed their tags, which left a total valid release of 33,077 tagged smolts.

CODED WIRE TAG RECOVERY

During random sampling of the sport and commercial fisheries in 1998, we recovered 615 CWTs with codes released at Slippery Creek in 1997 (Appendix A1). The greatest number (504) of tags were recovered from the commercial troll fishery, most in the Northwest Quadrant on the outside coast (Table 3). In marine purse seine fisheries, 96 tags were recovered, mostly from District 109 (Chatham Strait/Frederick Sound), with the others from District 112 and 104. Fourteen (14) tags were recovered in the marine recreational fishery around Sitka in July and August. One CWT was recovered in the gillnet fishery in District 106. Coho salmon bearing Slippery Creek tags were recovered in the troll fishery throughout the season. In 1998, most coho salmon bound for Slippery Creek traveled along the outer coast and entered inside waters around the southern tip of Baranof Island and into Chatham Strait before entering Port Camden (Figure 3).

ESTIMATE OF θ AND SMOLT ABUNDANCE

The total number of outmigrating coho salmon smolts ≥ 70 mm from Slippery Creek in 1997 is estimated at 43,544 (SE = 980). Out of the 623 coho salmon inspected at the adult weir in the 1998 escapement, 473 (75.9%) were missing adipose fins, and were therefore checked for CWTs; one fish was missing an adipose fin and determined to not have a CWT. Because the incidence of naturally missing adipose fins was assumed to be extremely small, the head with no tag was assumed to be a Slippery Creek coho salmon that shed the coded wire tag.

ESTIMATES OF HARVEST, ESCAPEMENT AND EXPLOITATION IN 1998

An estimated 2,932 (SE = 114) coho salmon originating from Slippery Creek were harvested in marine commercial and sport fisheries in 1998. The troll fishery in the Northwest Quadrant took 48% of the estimated marine harvest, and the seine fisheries in Chatham Strait (Districts 109 and 112) took 22.5% (Table 4). Harvests in these fisheries occurred from July through mid-September. The troll harvest was spread over a long period (July to September), and the peak of the seine harvests occurred in August (Figure 3). Using harvest and sampling data from Hubartt et al. (1999), we estimated harvest in the Sitka marine recreational fishery to be 60 fish.

A total of 632 coho salmon returned to Slippery Creek in 1998; 623 were marked and counted past the weir between 1 September and 18 October, and another 9 unmarked fish were sampled in Slippery Creek above the weir or at the lake outlet after the weir was fish tight. The estimated marine survival rate was 8.2% (with a 95% CI relative precision of 7.9%), and the estimated exploitation rate in marine commercial and sport fisheries 82.3% (with a 95% CI relative precision of 10.2%).

Age composition of adult coho salmon sampled from catches at Slippery Creek in 1998 was 62.3% (SE = 0.5%) age 2.1 and 37.7% (SE = 1.9%) age 1.1. The mean length of adults (mid eye to tail fork, MEF) at Slippery Creek was 606 mm (SE = 3.1), and 55.3% of the 85 fish sampled were females.

DISCUSSION

Slippery Creek stock assessment is especially valuable if it represents similar systems in the central inside waters (Chatham and Sumner Strait and Frederick Sound; Figure 4). If data can be collected in a timely fashion, it may also find use as an inseason management tool to assess run strength. Other stock assessment programs that can be used in conjunction with the Slippery Creek analysis to evaluate run strength

Table 2.—Daily counts of coho salmon smolt caught and tagged at the Slippery Creek smolt trap during 1997.

Date	Total tagged	Overnight mortality	Live tagged	Retention rate	Number retagged	Valid tags	Date	Total tagged	Overnight mortality	Live tagged	Retention rate	Number retagged	Valid tags
21-Apr	2	2	0	0	0	0	17-May	649	2	647	0.945	0	611
22-Apr	7	0	7	1.000	0	7	18-May	584	1	583	0.950	0	554
23-Apr	44	10	34	1.000	0	34	19-May	860	4	856	0.987	0	845
24-Apr	90	5	85	0.989	1	85	20-May	876	0	876	1.000	0	876
25-Apr	80	14	66	0.910	6	66	21-May	918	5	913	1.000	0	913
26-Apr	33	0	33	0.780	7	33	22-May	821	2	819	1.000	0	819
27-Apr	228	8	220	0.960	9	220	23-May	1084	2	1082	1.000	0	1082
28-Apr	357	9	348	1.000	0	348	24-May	798	2	796	1.000	0	796
29-Apr	166	7	159	1.000	0	159	25-May	645	3	642	0.992	0	637
30-Apr	370	12	358	1.000	0	358	26-May	439	2	437	1.000	0	437
01-May	210	7	203	0.650	71	203	27-May	339	0	339	0.991	0	336
02-May	226	17	209	0.540	96	209	28-May	162	0	162	0.994	0	161
03-May	576	8	568	1.000	0	568	29-May	175	2	173	1.000	0	173
04-May	1273	10	1263	1.000	0	1263	30-May	264	1	263	1.000	0	263
05-May	1559	4	1555	1.000	0	1555	31-May	208	0	208	0.985	0	205
06-May	1409	5	1404	0.980	0	1376	01-Jun	196	0	196	0.948	0	186
07-May	1955	3	1952	1.000	0	1952	02-Jun	154	1	153	0.966	0	148
08-May	1702	5	1697	1.000	0	1697	03-Jun	133	2	131	1.000	0	131
09-May	1354	3	1351	0.958	0	1294	04-Jun	119	2	117	1.000	0	117
10-May	2188	0	2188	0.979	0	2142	05-Jun	153	2	151	0.990	0	149
11-May	1102	1	1101	0.946	0	1042	06-Jun	139	2	137	1.000	0	137
12-May	993	0	993	1.000	0	993	07-Jun	157	3	154	0.944	0	145
13-May	1584	14	1570	0.995	0	1562	08-Jun	197	2	195	1.000	0	195
14-May	1401	7	1394	0.992	0	1383	09-Jun	169	0	169	0.983	0	166
15-May	2492	19	2473	1.000	0	2473	10-Jun	124	2	122	0.976	0	119
16-May	1919	10	1909	0.927	0	1770	11-Jun	84	0	84	1.000	0	84
-continued-													
TOTALS							33765						
220							33545						
0.986							190						
33077													

Table 3.—Estimated marine harvest of adult coho salmon bound for the Slippery Creek in 1998. In fishing periods and fishing quadrants for which no CWT was recovered with the appropriate code, harvest was assumed to be zero.

TROLL FISHERY														
Stat. week	Dates	Period	Quad.	N	var[\hat{N}]	n	a	a'	t	t'	m _c	\hat{r}	SE[\hat{r}]	RP[\hat{r}]
19–33	5/3–8/15	3	NW	762,167	0	232,803	4,712	4,645	3,917	3,913	301	1,318	73	11%
19–33	5/3–8/15	3	NE	135,976	0	36,893	699	688	575	573	114	564	49	17%
19–33	5/3–8/15	3	SE	122,693	0	76,236	892	878	665	664	13	28	6	40%
19–33	5/3–8/15	3	SW	184,373	0	82,554	804	793	549	548	9	27	7	53%
34–41	8/16–10/10	4	NE	31,778	0	11,904	295	293	237	236	47	167	21	25%
34–41	8/16–10/10	4	NW	314,915	0	85,395	2,246	2,230	1,952	1,950	18	88	19	41%
34–41	8/16–10/10	4	SE	59,399	0	36,447	711	702	558	556	2	4	2	102%
Subtotal troll fishery				1,611,062	0	562,232	10,359	10,229	8,453	8,440	504	2,196	93	8%
SPORT FISHERY														
Biweek	Dates	Derby	Area	N	var[\hat{N}]	n	a	a'	t	t'	m _c	\hat{r}	SE[\hat{r}]	RP[\hat{r}]
14	7/6–7/19	no	Sitka	6,238	3,087,493	1,786	33	33	30	30	1	5	4	175%
15	7/20–8/2	no	Sitka	10,640	3,769,918	3,752	94	87	83	83	6	24	10	77%
16	8/3–8/16	no	Sitka	14,903	6,385,157	4,435	162	160	145	145	5	22	10	83%
17	8/17–8/30	no	Sitka	8,088	2,305,807	2,509	87	82	75	75	2	9	6	126%
Subtotal sport fishery				39,869	15,548,375	12,482	376	362	333	333	14	60	15	49%
SEINE FISHERY														
Stat. week	Dates	District		N	var[\hat{N}]	n	a	a'	t	t'	m _c	\hat{r}	SE[\hat{r}]	RP[\hat{r}]
30	7/19–7/25	109		1,962	0	174	4	4	3	3	1	15	14	189%
30 ^a	7/19–7/25	112		2,574	0	179	5	5	5	5	1	19	18	191%
31	7/26–8/1	109		9,708	0	2,150	67	66	61	61	21	127	25	39%
31	7/26–8/1	110		1,503	0	375	9	9	5	5	1	5	5	176%
31 ^a	7/26–8/1	112		5,594	0	422	24	22	19	19	4	76	37	95%
32	8/2–8/8	104		26,152	0	4,746	58	58	38	38	1	7	7	182%
32	8/2–8/8	109		11,282	0	2,500	52	52	45	45	16	95	22	45%
32	8/2–8/8	112		4,752	0	1,873	41	41	37	37	2	7	4	116%
32 ^a	8/2–8/8	112		2,360	0	737	19	19	19	19	1	4	4	171%
33	8/9–8/15	109		12,884	0	2,578	65	65	61	60	20	134	28	40%
34	8/16–8/22	109		23,922	0	3,509	81	79	68	68	12	111	30	53%
34	8/16–8/22	112		12,907	0	2,184	49	49	43	43	1	8	7	183%
35	8/23–8/29	109		10,421	0	5,674	110	110	95	95	10	24	6	47%
35	8/23–8/29	112		7,860	0	1,330	34	34	27	26	3	24	13	106%
36	8/30–9/5	109		12,907	0	2,184	49	49	43	43	2	16	10	129%
Subtotal seine fishery				146,788	0	30,615	667	662	569	567	96	672	69	21%
GILLNET FISHERY														
Stat. week	Dates	District		N	var[\hat{N}]	n	a	a'	t	t'	m _c	\hat{r}	SE[\hat{r}]	RP[\hat{r}]
36	8/30–9/5	106		21,852	0	8,189	140	140	119	119	1	4	3	166%
TOTAL ALL FISHERIES				1,819,571	15,548,375	613,518	11,542	11,393	9,474	9,459	615	2,932	114	7.6%

^a Terminal fishery.

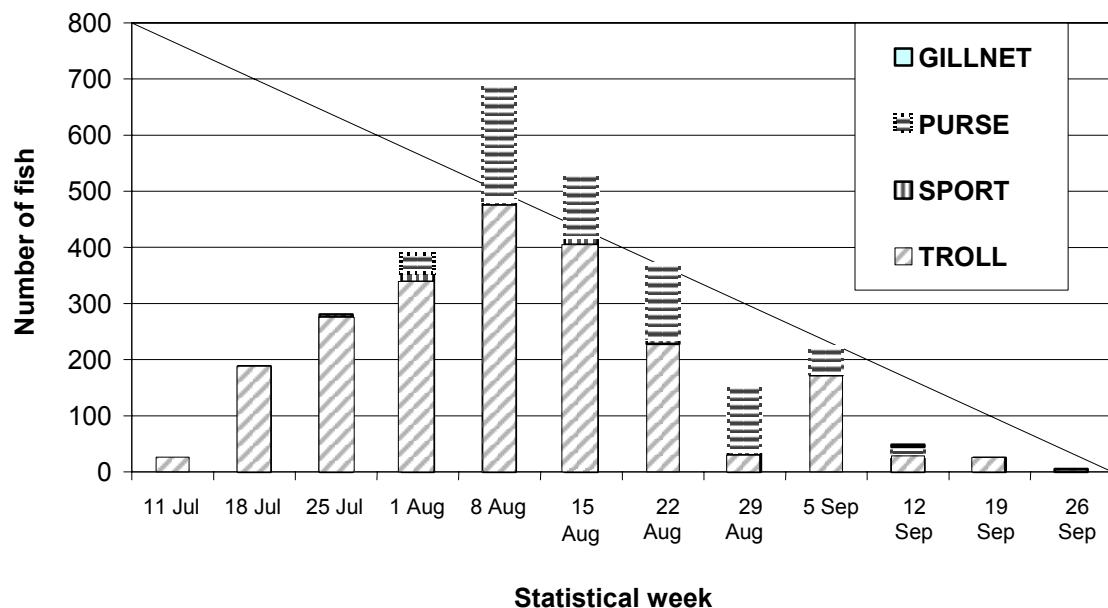


Figure 3.—Estimated harvests, by statistical week, of coho salmon bound for Slippery Creek by marine commercial and recreational fisheries in 1998.

Table 4.—Estimated harvest, exploitation, and total run of Slippery Creek coho salmon in 1998.

Fishery	Area	Estimated harvest	SE	Percent of marine harvest	Percent of total run	Removal rate ^a
U.S. troll fishery	NW Quad	1,406	77	48.0	39.5	
	NE Quad	731	54	24.9	20.5	
	SE Quad	32	6	1.1	0.9	
	SW Quad	27	7	0.9	.3	
	Subtotal	2,196	87	74.9	61.6	61.6%
Recreational	Sitka	60	15	2.1	1.7	4.4%
Seine fishery	Dist. 109	521	52	17.8	14.6	
	Dist. 112	138	29	4.7	3.9	
	Dist. 104	7	7	0.2	0.2	
	Dist. 110	5	5	0.2	0.1	
	Subtotal	672	69	22.9	18.9	51.3%
Drift gillnet	Dist. 106	4	3	0.1	0.1	0.6%
Total marine harvest		2,932	114	100.0	82.3	
Escapement		632	0		17.7	
TOTAL RUN		3,564	114		100.0	

^a Percent of available population harvested by a fishery.

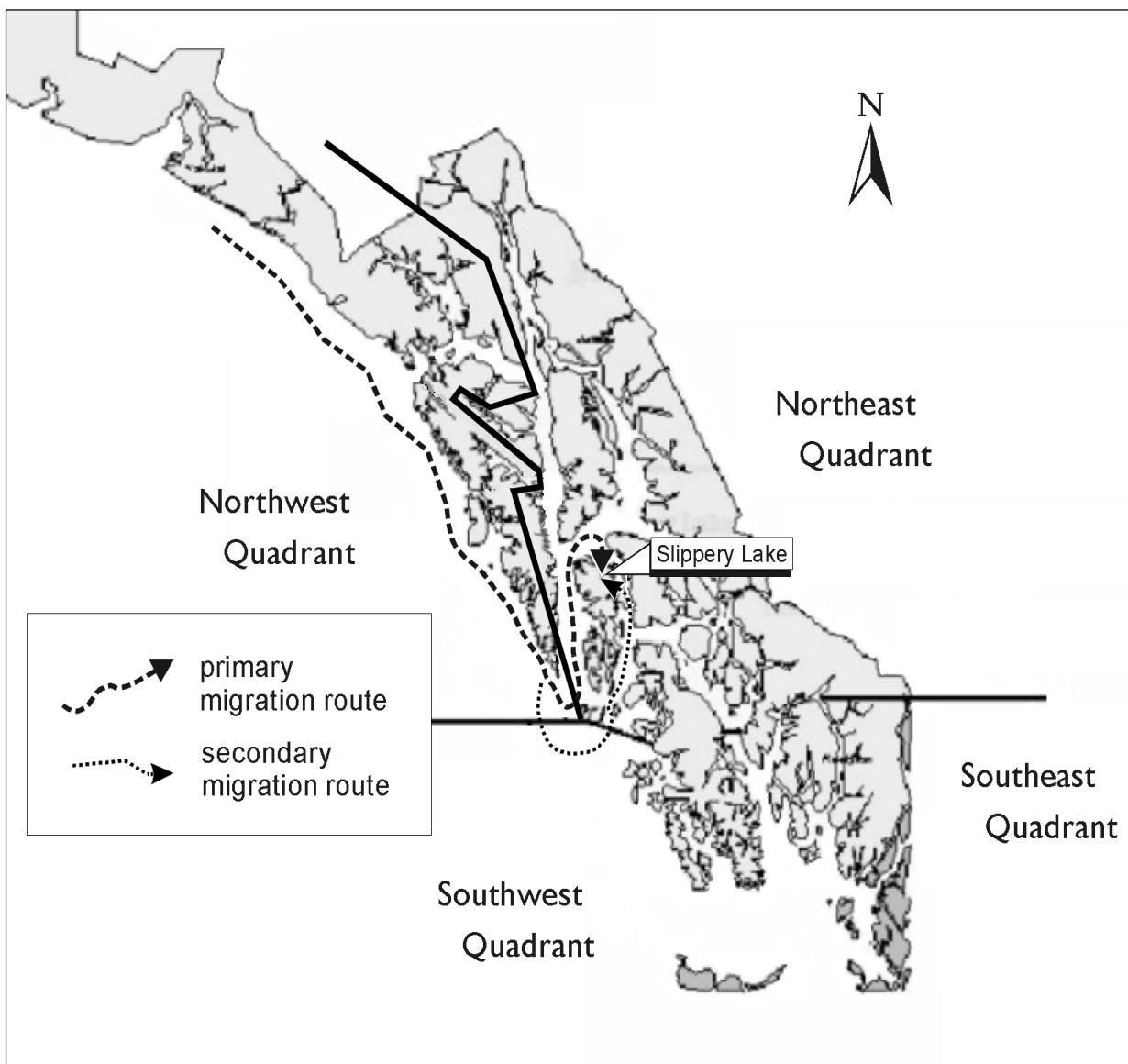


Figure 4.—Migration routes through Southeast Alaska of coho salmon bound for Slippery Creek.

are the Ford Arm and Nakwasina River programs in the central outside waters (coast of Chichagof and Baranof Islands), and the Naha River and Hugh Smith Lake projects in southern inside waters (Clarence Strait). Because one half of the Slippery Creek CWTs are recovered by early August, assessment of this stock could provide adequate information to make projections to meet fishery management goals.

The estimated exploitation rate (82.3%) is considered high; average exploitation rates of marked stocks by all fisheries in Southeast Alaska from 1990 to 1997 was 62% (Shaul 1998). Forty percent (40%) of the total adult run in 1998 was harvested in troll fisheries in central outside waters before the fish moved into Chatham Strait around the southern tip of Baranof Island; another 39% was harvested by troll and seine fisheries in central inside waters (Figure 4). Fishery harvest data for the 1998 adult return are not available for other coho systems in central inside waters, but 1998 exploitation rates for Ford Arm (central outside waters) and Hugh Smith Lake (southern inside waters) were 56.0% and 77.3%, respectively (Leon Shaul, Alaska Department of Fish and Game, Douglas, personal communication).

Estimated marine survival rate (8.2%) for the 1998 Slippery Creek adult return is lower than most estimates for other wild stocks in Southeast Alaska for which estimates were obtained for the 1998 adult return. Estimated marine survivals were 19.2% for Auke Lake, 11.6% for Berners River and 8.2% for Hugh Smith Lake (Leon Shaul, Alaska Department of Fish and Game, Douglas, personal communication). The 1998 rate at Slippery Creek may be considered moderate if it follows trends over time similar to other coho salmon stocks. Coho salmon in Southeast Alaska averaged 19.7% marine survival from 1990–1996 (Shaul 1998). Recent (1991–1994) marine survival rate averages estimated for other coho salmon stocks in Southeast Alaska were 25% for Auke Lake, 21% for Berners River, 15% for Ford Arm, and 17% for Hugh Smith Lake (Shaul 1994; McPherson and Bernard 1996; Shaul and Crabtree 1996), but 10-year averages were 18% for Auke Lake, 11% for Ford Arm and 13% for Hugh Smith Lake

(Shaul 1998). Taku River marine survival averaged 16% for the 1993–1995 adult returns.

While the population in this experiment to estimate smolt abundance was not closed to losses from mortality, it was closed to recruitment, because salmon return to their natal stream to spawn. The models we used to estimate harvest of coho salmon from Slippery Creek are based on sampling as a random process, yet the capture of smolts at Slippery Creek and catch sampling of harvests were not random, but systematic. Representative samples can be drawn with a systematic process only if (1) every smolt has an equal chance of being marked, (2) every adult has an equal chance of being sampled, or (3) marked and unmarked fish mix completely between sampling events. Tagging a representative sample of smolts, or having tagged and untagged fish mix completely, are also crucial to accurately estimating harvest of adult coho salmon. A large percentage (75.9%) of the total smolt outmigration was tagged over a considerable portion of the run; thus, I believe this condition was also met (Appendix A2). Only valid tags (present and decoded) were used for estimating harvest. Because every adult salmon passing the weir was inspected for marks, and a high percentage (>75%) were marked, uncertainty in estimating θ was low ($CV < 3\%$).

Escapement (632) and the estimate of total run (3,564) are biased slightly low, because a small number of adult fish passed by the weir site uncounted before 1 September and/or after 18 October. I believe the number of uncounted fish to be less than 50—not enough to significantly alter any of the results of this report.

CONCLUSIONS AND RECOMMENDATIONS

Results from this project contribute to a long-term regionwide database useful for inseason assessment of run strength, adult production and developing adequate escapement goals. Additional wild stock index sites within the inside waters of central Southeast Alaska should be investigated, and analysis of coho salmon releases at Crystal Lake Hatchery near Petersburg may also prove to be of

value. This initial investigation indicates that the Slippery Creek coho salmon run may serve as an indicator for run strength within the inside waters of central Southeast Alaska.

As this project will continue annually, we recommend strategies to continue meeting the precision of smolt and adult parameter estimates. It is likely that CWT sampling rates in commercial and sport fisheries will continue to be in the 20–35% range; it is therefore important that a high percentage (>70%) of the smolt outmigration be CWT tagged and that all coho salmon be sampled for adipose finclips at the adult weir. Also, since 9 unmarked adults were caught above the weir after it was fish tight on 1 September, the weir should be fish tight by 15 August, to ensure adequate accounting of the adult escapement.

ACKNOWLEDGMENTS

We thank the many individuals who helped complete this study; personnel are from ADF&G unless noted otherwise. We thank Richard Greene, Peter Branson, Jeff Meucci for collecting data from adults, constructing and operating the adult fish weir and adult marking in 1998; Mary Meucci for project expediting; Glen Oliver and his port sampling crews for commercial fisheries CWT recoveries; Paul Suchanek and Brian Frenette and his creel census crews for CWT recoveries from the Juneau and Sitka area recreational fisheries; Karen Crandall, Ron Josephson, Detlef Buettner, Anna Sharp, and the CF Tag Lab in Juneau for dissecting and decoding heads and providing sampling supplies and data on CWT recoveries; and Sue Millard for aging adult scales. Scott McPherson, Richard Yanuz and Robert Marshall provided biometric support and editorial comment. Alma Seward helped prepare the final manuscript. Dick Ahoe and John McDonell played key roles in promoting a cooperative atmosphere between government agencies and providing access to USFS cabins and materials for modifications to the fish pass for weir construction.

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APPENDIX A

Appendix A1.—Random and select recoveries of coded wire tagged coho salmon bound for Slippery Creek by date sampled in 1998.

SURVEY SITE	SAMPLE NUM	HEAD	SAMPLE TYPE	GEAR CLASS	DATE	STAT WEEK	PERIOD	QUAD	DISTRICT	TAG CODE
SITKA	98030511	65344	R	TROLL	2-Jul-98	27	3	NW	113	43120
SITKA	98030529	65413	R	TROLL	3-Jul-98	27	3	NW	113	44813
SITKA	98030535	55256	R	TROLL	3-Jul-98	27	3	NW	113	44813
SITKA	98030550	65374	R	TROLL	4-Jul-98	27	3	NW	113	44334
SITKA	98030554	65421	R	TROLL	4-Jul-98	27	3	NW	113	44813
SITKA	98030559	65448	R	TROLL	4-Jul-98	27	3	NW	113	44813
SITKA	98030579	117332	R	TROLL	5-Jul-98	28	3	NW	113	43120
SITKA	98030579	117328	R	TROLL	5-Jul-98	28	3	NW	113	44334
PORT ALEXANDER	98080028	29483	R	TROLL	5-Jul-98	28	3	NE	109	44813
SITKA	98030577	117319	R	TROLL	5-Jul-98	28	3	NW	113	44813
HOONAH	98110042	40075	R	TROLL	5-Jul-98	28	3	NW	113	44813
EXCURSION INLET	98100012	51833	R	TROLL	5-Jul-98	28	3	NW	113	44813
HOONAH	98110041	40073	R	TROLL	6-Jul-98	28	3	NW	113	43120
PETERSBURG	98050222	34225	R	TROLL	6-Jul-98	28	3			44334
SITKA	98030586	55258	R	TROLL	6-Jul-98	28	3	NW	113	44813
SITKA	98030598	117351	R	TROLL	6-Jul-98	28	3	NW	113	44813
SITKA	98030591	55281	R	TROLL	6-Jul-98	28	3	NW	113	44938
SITKA	98030617	65622	R	TROLL	7-Jul-98	28	3	NW	113	43120
PETERSBURG	98050253	34236	R	TROLL	7-Jul-98	28	3	NW	113	43120
EXCURSION INLET	98100014	51716	R	TROLL	7-Jul-98	28	3	NW		43120
SITKA	98030603	55553	R	TROLL	7-Jul-98	28	3	NW	113	44813
HOONAH	98110052	40132	R	TROLL	7-Jul-98	28	3	NW	113	44813
HOONAH	98110052	40142	R	TROLL	7-Jul-98	28	3	NW	113	44813
EXCURSION INLET	98100014	51710	R	TROLL	7-Jul-98	28	3	NW		44813
SITKA	98030627	65633	R	TROLL	8-Jul-98	28	3	NW	113	43120
HOONAH	98110054	40165	R	TROLL	8-Jul-98	28	3	NW	113	43120
PELICAN	98010021	37120	R	TROLL	8-Jul-98	28	3	NW	113	44334
HOONAH	98110054	40185	R	TROLL	8-Jul-98	28	3	NW	113	44334
PELICAN	98010019	37112	R	TROLL	8-Jul-98	28	3	NW	157	44813
SITKA	98030639	65588	R	TROLL	9-Jul-98	28	3	NW	113	43120
CRAIG	98070079	43615	R	TROLL	9-Jul-98	28	3	SW	103	44813
SITKA	98030638	55590	R	TROLL	9-Jul-98	28	3	NW	113	44813
SITKA	98030657	66876	R	TROLL	10-Jul-98	28	3	NW	113	43120
SITKA	98030657	66868	R	TROLL	10-Jul-98	28	3	NW	113	43120
SITKA	98030655	66860	R	TROLL	10-Jul-98	28	3	NW	113	43120
SITKA	98030655	66855	R	TROLL	10-Jul-98	28	3	NW	113	43120
SITKA	98030660	65671	R	TROLL	10-Jul-98	28	3	NW	113	43120
EXCURSION INLET	98100021	51939	R	TROLL	10-Jul-98	28	3	NW		43120
EXCURSION INLET	98100021	51941	R	TROLL	10-Jul-98	28	3	NW		43120
SITKA	98030655	66854	R	TROLL	10-Jul-98	28	3	NW	113	44334
SITKA	98030655	66859	R	TROLL	10-Jul-98	28	3	NW	113	44813
SITKA	98030660	65679	R	TROLL	10-Jul-98	28	3	NW	113	44813
EXCURSION INLET	98100021	51610	R	TROLL	10-Jul-98	28	3	NW		44813
EXCURSION INLET	98100021	51930	R	TROLL	10-Jul-98	28	3	NW		44813
SITKA	98030655	66850	R	TROLL	10-Jul-98	28	3	NW	113	44938
SITKA	98030666	55352	R	TROLL	11-Jul-98	28	3	NW	113	43120
SITKA	98030735	66766	R	TROLL	11-Jul-98	28	3	NW	113	44334
SITKA	98030676	56566	R	TROLL	11-Jul-98	28	3	NW	113	44813
SITKA	98030674	56563	R	TROLL	11-Jul-98	28	3	NW	154	44813
CRAIG	98070117	43251	R	TROLL	12-Jul-98	29	3	SW	104	43120
CRAIG	98070112	43172	R	TROLL	12-Jul-98	29	3	SW	104	43120
PORT ALEXANDER	98080071	29617	R	TROLL	12-Jul-98	29	3	NE	109	43120
SITKA	98030701	56602	R	TROLL	12-Jul-98	29	3	NW	113	43120
ELFIN COVE	98020120	50582	R	TROLL	12-Jul-98	29	3	NW	113	43120
ELFIN COVE	98020123	50586	R	TROLL	12-Jul-98	29	3	NW	113	44334
CRAIG	98070110	43143	R	TROLL	12-Jul-98	29	3	SW	104	44813
CRAIG	98070109	43139	R	TROLL	12-Jul-98	29	3	SW	104	44813
CRAIG	98070111	43164	R	TROLL	12-Jul-98	29	3	SW	104	44813
HOONAH	98110060	40392	R	TROLL	12-Jul-98	29	3	NW	113	44813
SITKA	98030697	56581	R	TROLL	12-Jul-98	29	3	NW	113	44813
KETCHIKAN	98060158	23277	R	TROLL	12-Jul-98	29	3	SW		44813
SITKA	98030732	66565	S	TROLL	12-Jul-98	29	3			43120
SITKA	98030740	66789	S	TROLL	12-Jul-98	29	3	NW	156	44813
HOONAH	98110062	44907	R	TROLL	13-Jul-98	29	3	NW	113	44813
HOONAH	98110062	44906	R	TROLL	13-Jul-98	29	3	NW	113	44813
SITKA	98030734	66530	S	TROLL	13-Jul-98	29	3			43120
SITKA	98030730	66553	S	TROLL	13-Jul-98	29	3			44813
SITKA	98030730	66554	S	TROLL	13-Jul-98	29	3			44938
HOONAH	98110066	44923	R	TROLL	14-Jul-98	29	3	NW	113	43120
HOONAH	98110067	44929	R	TROLL	14-Jul-98	29	3	NW	113	44813
HOONAH	98110067	44942	R	TROLL	14-Jul-98	29	3	NW	113	44938
SITKA	98030744	66926	R	TROLL	15-Jul-98	29	3	NW	113	44813
SITKA	98030742	66909	R	TROLL	15-Jul-98	29	3	NW	113	44813
SITKA	98030742	66904	R	TROLL	15-Jul-98	29	3	NW	113	44813
SITKA	98030742	66908	R	TROLL	15-Jul-98	29	3	NW	113	44813
SITKA	98030745	66928	R	TROLL	15-Jul-98	29	3	NW		44813
SITKA	98030749	66001	R	TROLL	16-Jul-98	29	3	NW	113	43120
HOONAH	98110071	44978	R	TROLL	16-Jul-98	29	3	NW	113	43120
EXCURSION INLET	98100033	51890	R	TROLL	16-Jul-98	29	3	NW		43120
EXCURSION INLET	98100033	51893	R	TROLL	16-Jul-98	29	3	NW		44334
SITKA	98030754	66946	R	TROLL	16-Jul-98	29	3	NW	113	44813
SITKA	98030750	66014	R	TROLL	16-Jul-98	29	3	NW	113	44813
SITKA	98030758	66971	R	TROLL	16-Jul-98	29	3	NW	113	44813

-continued-

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SURVEY SITE	SAMPLE NUM	HEAD	SAMPLE TYPE	GEAR CLASS	DATE	STAT WEEK	PERIOD	QUAD	DISTRICT	TAG CODE
SITKA	98030758	66976	R	TROLL	16-Jul-98	29	3	NW	113	44813
HOONAH	98110071	44973	R	TROLL	16-Jul-98	29	3	NW	113	44813
HOONAH	98110071	44967	R	TROLL	16-Jul-98	29	3	NW	113	44813
HOONAH	98110071	44968	R	TROLL	16-Jul-98	29	3	NW	113	44813
EXCURSION INLET	98100033	51673	R	TROLL	16-Jul-98	29	3	NW	113	44813
ELFIN COVE	98020136	50597	R	TROLL	16-Jul-98	29	3	NW	113	44938
SITKA	98030780	66049	R	TROLL	17-Jul-98	29	3	NW	43120	
PORT ALEXANDER	98080081	29641	R	TROLL	17-Jul-98	29	3	NE	109	44334
SITKA	98030764	65992	R	TROLL	17-Jul-98	29	3	NW	113	44334
CRAIG	98070148	43295	R	TROLL	17-Jul-98	29	3	SE	105	44813
CRAIG	98070150	43278	R	TROLL	17-Jul-98	29	3	SE	105	44813
SITKA	98030780	66045	R	TROLL	17-Jul-98	29	3	NW	44813	
SITKA	98030780	66031	R	TROLL	17-Jul-98	29	3	NW	44813	
PELICAN	98010036	37209	R	TROLL	17-Jul-98	29	3	NW	44813	
SITKA	98035223	64249	R	SPORT	17-Jul-98	29		NW	113	44813
CRAIG	98070157	43474	R	TROLL	18-Jul-98	29	3	SE	105	43120
PORT ALEXANDER	98080088	29682	R	TROLL	18-Jul-98	29	3	NE	109	43120
PORT ALEXANDER	98080086	29672	R	TROLL	18-Jul-98	29	3	NE	109	43120
PORT ALEXANDER	98080089	29687	R	TROLL	18-Jul-98	29	3	NE	109	43120
SITKA	98030774	66988	R	TROLL	18-Jul-98	29	3	NW	113	43120
SITKA	98030773	66979	R	TROLL	18-Jul-98	29	3	NW	113	43120
SITKA	98030786	66082	R	TROLL	18-Jul-98	29	3	NW	113	43120
HOONAH	98110073	44958	R	TROLL	18-Jul-98	29	3	NW	113	44334
CRAIG	98070158	43455	R	TROLL	18-Jul-98	29	3	SE	105	44813
PORT ALEXANDER	98080086	29673	R	TROLL	18-Jul-98	29	3	NE	109	44813
PORT ALEXANDER	98080088	29677	R	TROLL	18-Jul-98	29	3	NE	109	44813
PORT ALEXANDER	98080086	29665	R	TROLL	18-Jul-98	29	3	NE	109	44813
PORT ALEXANDER	98080085	29657	R	TROLL	18-Jul-98	29	3	NE	109	44813
SITKA	98030773	66983	R	TROLL	18-Jul-98	29	3	NW	113	44813
SITKA	98030768	66434	R	TROLL	18-Jul-98	29	3	NW	113	44813
SITKA	98030768	66429	R	TROLL	18-Jul-98	29	3	NW	113	44813
SITKA	98030770	66444	R	TROLL	18-Jul-98	29	3	NW	113	44813
SITKA	98030786	66093	R	TROLL	18-Jul-98	29	3	NW	113	44813
SITKA	98030786	66084	R	TROLL	18-Jul-98	29	3	NW	113	44813
SITKA	98030786	66070	R	TROLL	18-Jul-98	29	3	NW	113	44813
SITKA	98030786	66085	R	TROLL	18-Jul-98	29	3	NW	113	44813
CRAIG	98070158	43452	R	TROLL	18-Jul-98	29	3	SE	105	44938
PORT ALEXANDER	98080088	29681	R	TROLL	18-Jul-98	29	3	NE	109	44938
PORT ALEXANDER	98080095	29708	R	TROLL	19-Jul-98	30	3	NE	109	43120
PORT ALEXANDER	98080095	29714	R	TROLL	19-Jul-98	30	3	NE	109	43120
SITKA	98030782	66461	R	TROLL	19-Jul-98	30	3	NW	113	43120
SITKA	98030778	66314	R	TROLL	19-Jul-98	30	3	NW	113	43120
SITKA	98030778	66315	R	TROLL	19-Jul-98	30	3	NW	113	44334
SITKA	98030781	66453	R	TROLL	19-Jul-98	30	3	NW	113	44813
SITKA	98030785	66479	R	TROLL	19-Jul-98	30	3			44813
SITKA	98030785	66478	R	TROLL	19-Jul-98	30	3			44813
SITKA	98030785	66467	R	TROLL	19-Jul-98	30	3			44813
SITKA	98030790	66353	R	TROLL	20-Jul-98	30	3	NW	113	43120
PELICAN	98010044	37270	R	TROLL	20-Jul-98	30	3	NW	113	43120
PELICAN	98010045	37275	R	TROLL	20-Jul-98	30	3	NW	113	44334
SITKA	98030788	66331	R	TROLL	20-Jul-98	30	3	NW	154	44334
PETERSBURG	98050385	21262	R	PURSE	20-Jul-98	30		NE	112	44813
SITKA	98030793	66382	R	TROLL	20-Jul-98	30	3	NW	154	44813
SITKA	98030787	66097	R	TROLL	20-Jul-98	30	3	NW		44813
EXCURSION INLET	98100034	51626	R	TROLL	20-Jul-98	30	3	NW		44813
EXCURSION INLET	98100034	51642	R	TROLL	20-Jul-98	30	3	NW		44813
SITKA	98030802	66147	R	TROLL	21-Jul-98	30	3	NW	113	43120
SITKA	98030805	66395	R	TROLL	21-Jul-98	30	3	NW	154	43120
SITKA	98030806	56806	R	TROLL	21-Jul-98	30	3	NW		43120
SITKA	98030804	66386	R	TROLL	21-Jul-98	30	3	NW	113	44334
SITKA	98030803	66157	R	TROLL	21-Jul-98	30	3	NW	113	44813
SITKA	98030802	66146	R	TROLL	21-Jul-98	30	3	NW	113	44813
SITKA	98030806	66997	R	TROLL	21-Jul-98	30	3	NW		44813
SITKA	98035241	39992	R	SPORT	21-Jul-98	30		NW	113	44813
PORT ALEXANDER	98080099	29721	R	TROLL	22-Jul-98	30	3	NE	109	43120
SITKA	98030824	56943	R	TROLL	22-Jul-98	30	3	NW	113	43120
SITKA	98030818	56864	R	TROLL	22-Jul-98	30	3	NW	113	43120
SITKA	98030848	66231	R	TROLL	22-Jul-98	30	3	NW		43120
SITKA	98030848	66225	R	TROLL	22-Jul-98	30	3	NW		43120
ELFIN COVE	98020146	50620	R	TROLL	22-Jul-98	30	3	NW		43120
SITKA	98030848	66235	R	TROLL	22-Jul-98	30	3	NW		43120
SITKA	98030817	56849	R	TROLL	22-Jul-98	30	3	NW		43120
EXCURSION INLET	98100035	51565	R	TROLL	22-Jul-98	30	3	NW		43120
ELFIN COVE	98020146	50617	R	TROLL	22-Jul-98	30	3	NW		43120
SITKA	98035252	64254	R	SPORT	22-Jul-98	30		NW	113	43120
PELICAN	98010047	37282	R	TROLL	22-Jul-98	30	3	NW	113	44334
SITKA	98030822	56941	R	TROLL	22-Jul-98	30	3	NW		44334
PORT ALEXANDER	98080099	29723	R	TROLL	22-Jul-98	30	3	NE	109	44813
PORT ALEXANDER	98080098	29720	R	TROLL	22-Jul-98	30	3	NE	109	44813
SITKA	98030822	56938	R	TROLL	22-Jul-98	30	3	NW		44813
SITKA	98030848	66241	R	TROLL	22-Jul-98	30	3	NW		44938
SITKA	98030848	66262	R	TROLL	22-Jul-98	30	3	NW		44938
CRAIG	98070217	43843	R	TROLL	23-Jul-98	30	3	SW	104	43120
PORT ALEXANDER	98080101	29728	R	TROLL	23-Jul-98	30	3	NE	109	43120
PORT ALEXANDER	98080107	29755	R	TROLL	23-Jul-98	30	3	NE	109	43120

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SURVEY SITE	SAMPLE NUM	HEAD	SAMPLE TYPE	GEAR CLASS	DATE	STAT WEEK	PERIOD	QUAD	DISTRICT	TAG CODE
KETCHIKAN	98060240	27367	R	TROLL	23-Jul-98	30	3	SW	103	44813
PORT ALEXANDER	98080103	29745	R	TROLL	23-Jul-98	30	3	NE	109	44813
PORT ALEXANDER	98080102	29734	R	TROLL	23-Jul-98	30	3	NE	109	44813
PORT ALEXANDER	98080102	29736	R	TROLL	23-Jul-98	30	3	NE	109	44813
PORT ALEXANDER	98080101	29727	R	TROLL	23-Jul-98	30	3	NE	109	44813
PORT ALEXANDER	98080109	29759	R	TROLL	23-Jul-98	30	3	NE	109	44813
PORT ALEXANDER	98080111	29772	R	TROLL	23-Jul-98	30	3	NE	109	44813
SITKA	98030835	57045	R	TROLL	23-Jul-98	30	3	NW	154	44813
PORT ALEXANDER	98080110	29764	R	TROLL	23-Jul-98	30	3			44813
SITKA	98030857	57226	S	TROLL	23-Jul-98	30	3			43120
SITKA	98030857	57217	S	TROLL	23-Jul-98	30	3			44813
PORT ALEXANDER	98080113	29776	R	TROLL	24-Jul-98	30	3	NE	109	43120
SITKA	98030843	57076	R	TROLL	24-Jul-98	30	3	NW	154	43120
SITKA	98030843	57072	R	TROLL	24-Jul-98	30	3	NW	154	43120
SITKA	98030842	57056	R	TROLL	24-Jul-98	30	3	NW	154	43120
SITKA	98030843	57071	R	TROLL	24-Jul-98	30	3	NW	154	43120
PETERSBURG	98050465	26077	R	PURSE	24-Jul-98	30		NE	109	44813
SITKA	98030844	57083	R	TROLL	24-Jul-98	30	3	NW	113	44813
SITKA	98030845	57089	R	TROLL	24-Jul-98	30	3	NW	154	44813
SITKA	98030843	57068	R	TROLL	24-Jul-98	30	3	NW	154	44813
SITKA	98030843	57066	R	TROLL	24-Jul-98	30	3	NW	154	44813
SITKA	98035262	64267	R	SPORT	24-Jul-98	30		NW	113	44813
CRAIG	98070249	43968	R	TROLL	25-Jul-98	30	3	SE	105	43120
PORT ALEXANDER	98080118	29801	R	TROLL	25-Jul-98	30	3	NE	109	43120
PORT ALEXANDER	98080117	29796	R	TROLL	25-Jul-98	30	3	NE	109	43120
PORT ALEXANDER	98080119	29814	R	TROLL	25-Jul-98	30	3	NE	109	43120
PORT ALEXANDER	98080119	29824	R	TROLL	25-Jul-98	30	3	NE	109	43120
PORT ALEXANDER	98080118	29798	R	TROLL	25-Jul-98	30	3	NE	109	44334
SITKA	98035229	39829	R	SPORT	25-Jul-98	30		NW	113	44334
PORT ALEXANDER	98080117	29795	R	TROLL	25-Jul-98	30	3	NE	109	44813
PORT ALEXANDER	98080118	29806	R	TROLL	25-Jul-98	30	3	NE	109	44813
PORT ALEXANDER	98080122	29832	R	TROLL	25-Jul-98	30	3	NE	109	44813
PORT ALEXANDER	98080119	29813	R	TROLL	25-Jul-98	30	3	NE	109	44813
PORT ALEXANDER	98080119	29818	R	TROLL	25-Jul-98	30	3	NE	109	44813
PORT ALEXANDER	98080119	29820	R	TROLL	25-Jul-98	30	3	NE	109	44813
PORT ALEXANDER	98080119	29808	R	TROLL	25-Jul-98	30	3	NE	109	44938
SITKA	98030856	57203	S	TROLL	25-Jul-98	30	3			43120
SITKA	98030860	56252	S	TROLL	25-Jul-98	30	3			44334
SITKA	98030856	66192	S	TROLL	25-Jul-98	30	3			44813
SITKA	98030856	66196	S	TROLL	25-Jul-98	30	3			44813
SITKA	98030858	57239	S	TROLL	25-Jul-98	30	3			44813
EXCURSION INLET	98100052	53612	R	PURSE	26-Jul-98	31		NE	112	43120
PORT ALEXANDER	98080125	29849	R	TROLL	26-Jul-98	31	3	NE	109	43120
PORT ALEXANDER	98080126	29854	R	TROLL	26-Jul-98	31	3	NE	109	43120
PORT ALEXANDER	98080126	29851	R	TROLL	26-Jul-98	31	3	NE	109	43120
PORT ALEXANDER	98080123	29846	R	TROLL	26-Jul-98	31	3	NE	109	43120
PETERSBURG	98050477	80041	R	TROLL	26-Jul-98	31	3	NE	109	43120
PORT ALEXANDER	98080123	29840	R	TROLL	26-Jul-98	31	3	NE	109	43120
PETERSBURG	98050477	80037	R	TROLL	26-Jul-98	31	3	NE	109	44813
PORT ALEXANDER	98080125	29850	R	TROLL	26-Jul-98	31	3	NE	109	44813
PETERSBURG	98050490	24014	R	PURSE	27-Jul-98	31		NE	109	43120
PETERSBURG	98050483	25814	R	PURSE	27-Jul-98	31		NE	109	43120
SITKA	98030869	57267	R	TROLL	27-Jul-98	31	3	NW	113	43120
SITKA	98030881	57179	R	TROLL	27-Jul-98	31	3			43120
SITKA	98030881	57716	R	TROLL	27-Jul-98	31	3			44334
SITKA	98030881	57191	R	TROLL	27-Jul-98	31	3			44334
SITKA	98030881	57182	R	TROLL	27-Jul-98	31	3			44334
PETERSBURG	98050505	24018	R	PURSE	27-Jul-98	31		NE	112	44813
PETERSBURG	98050489	24010	R	PURSE	27-Jul-98	31		NE	109	44813
PETERSBURG	98050481	26100	R	PURSE	27-Jul-98	31		NE	109	44813
PETERSBURG	98050489	24009	R	PURSE	27-Jul-98	31		NE	109	44813
CRAIG	98070256	16120	R	TROLL	27-Jul-98	31	3	SE	105	44813
PETERSBURG	98050517	25710	R	TROLL	27-Jul-98	31	3	NE	109	44813
HOONAH	98110101	44851	R	TROLL	27-Jul-98	31	3	NW	113	44813
SITKA	98030900	57821	R	TROLL	27-Jul-98	31	3	NW	113	44813
SITKA	98030881	57713	R	TROLL	27-Jul-98	31	3			44813
SITKA	98030881	57174	R	TROLL	27-Jul-98	31	3			44813
SITKA	98030881	57722	R	TROLL	27-Jul-98	31	3			44813
SITKA	98030881	57750	R	TROLL	27-Jul-98	31	3			44813
SITKA	98030881	57172	R	TROLL	27-Jul-98	31	3			44813
SITKA	98030881	57150	R	TROLL	27-Jul-98	31	3			44813
SITKA	98030881	57149	R	TROLL	27-Jul-98	31	3			44813
SITKA	98030881	57195	R	TROLL	27-Jul-98	31	3			44813
SITKA	98030881	57730	R	TROLL	27-Jul-98	31	3			44813
SITKA	98030881	57177	R	TROLL	27-Jul-98	31	3			44813
SITKA	98030881	57173	R	TROLL	27-Jul-98	31	3			44813
SITKA	98030881	57707	R	TROLL	27-Jul-98	31	3			44813
SITKA	98030881	57725	R	TROLL	27-Jul-98	31	3			44813
SITKA	98030881	57184	R	TROLL	27-Jul-98	31	3			44813
SITKA	98030881	57735	R	TROLL	27-Jul-98	31	3			44813
SITKA	98035296	39841	R	SPORT	27-Jul-98	31		NW	113	44813
SITKA	98035311	64283	R	SPORT	27-Jul-98	31		NW	113	44813
PETERSBURG	98050479	21296	R	PURSE	27-Jul-98	31		NE	109	44938
SITKA	98030881	57729	R	TROLL	27-Jul-98	31	3			44938
SITKA	98030881	57200	R	TROLL	27-Jul-98	31	3			44938

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SURVEY SITE	SAMPLE NUM	HEAD	SAMPLE TYPE	GEAR CLASS	DATE	STAT WEEK	PERIOD	QUAD	DISTRICT	TAG CODE
PORT ALEXANDER	98080133	29871	R	TROLL	28-Jul-98	31	3	NE	109	43120
SITKA	98030875	56995	R	TROLL	28-Jul-98	31	3	NE	109	43120
SITKA	98030887	57316	R	TROLL	28-Jul-98	31	3	NW	113	43120
SITKA	98030876	57612	R	TROLL	28-Jul-98	31	3	NW	113	44334
PETERSBURG	98050533	26795	R	TROLL	28-Jul-98	31	3	NE	109	44813
PORT ALEXANDER	98080132	29859	R	TROLL	28-Jul-98	31	3	NE	109	44813
PORT ALEXANDER	98080132	29861	R	TROLL	28-Jul-98	31	3	NE	109	44813
SITKA	98030875	57605	R	TROLL	28-Jul-98	31	3	NE	109	44813
SITKA	98030875	57610	R	TROLL	28-Jul-98	31	3	NE	109	44813
SITKA	98030875	56999	R	TROLL	28-Jul-98	31	3	NE	109	44813
SITKA	98030877	57622	R	TROLL	28-Jul-98	31	3	NW	113	44813
SITKA	98030878	57121	R	TROLL	28-Jul-98	31	3	NW	113	44813
SITKA	98030883	57770	R	TROLL	28-Jul-98	31	3	NW	113	44813
EXCURSION INLET	98100044	52232	R	TROLL	28-Jul-98	31	3	NW		44813
PETERSBURG	98050532	26796	R	TROLL	28-Jul-98	31	3	NE	109	44938
SITKA	98030925	57999	S	TROLL	28-Jul-98	31	3	NW	113	44813
PETERSBURG	98050564	25849	R	PURSE	29-Jul-98	31		NE	109	43120
SITKA	98030898	57793	R	TROLL	29-Jul-98	31	3	NE	109	43120
SITKA	98030898	57791	R	TROLL	29-Jul-98	31	3	NE	109	43120
SITKA	98030901	57843	R	TROLL	29-Jul-98	31	3	NW	113	43120
PELICAN	98010062	37417	R	TROLL	29-Jul-98	31	3	NW	116	43120
PELICAN	98010062	37407	R	TROLL	29-Jul-98	31	3	NW	116	43120
YAKUTAT	98140036	45387	R	TROLL	29-Jul-98	31	3	NW		43120
PETERSBURG	98050564	25848	R	PURSE	29-Jul-98	31		NE	109	44813
PETERSBURG	98050564	24028	R	PURSE	29-Jul-98	31		NE	109	44813
PORT ALEXANDER	98080135	29876	R	TROLL	29-Jul-98	31	3	NE	109	44813
SITKA	98030898	57780	R	TROLL	29-Jul-98	31	3	NE	109	44813
SITKA	98030898	57790	R	TROLL	29-Jul-98	31	3	NE	109	44813
ELFIN COVE	98020175	50654	R	TROLL	29-Jul-98	31	3	NW	113	44813
PELICAN	98010062	37412	R	TROLL	29-Jul-98	31	3	NW	116	44813
PELICAN	98010062	37400	R	TROLL	29-Jul-98	31	3	NW	116	44813
SITKA	98030898	57783	R	TROLL	29-Jul-98	31	3	NE	109	44938
SITKA	98030909	57892	S	TROLL	29-Jul-98	31	3			43120
SITKA	98030909	57894	S	TROLL	29-Jul-98	31	3			43120
SITKA	98030910	57922	S	TROLL	29-Jul-98	31	3			43120
SITKA	98030911	57963	S	TROLL	29-Jul-98	31	3			43120
SITKA	98030909	57885	S	TROLL	29-Jul-98	31	3			44813
SITKA	98030909	57895	S	TROLL	29-Jul-98	31	3			44813
SITKA	98030909	57900	S	TROLL	29-Jul-98	31	3			44813
SITKA	98030909	57908	S	TROLL	29-Jul-98	31	3			44813
SITKA	98030909	57910	S	TROLL	29-Jul-98	31	3			44813
SITKA	98030910	57917	S	TROLL	29-Jul-98	31	3			44813
SITKA	98030910	57928	S	TROLL	29-Jul-98	31	3			44813
PORT ALEXANDER	98080136	29888	R	TROLL	30-Jul-98	31	3	NE	109	43120
PORT ALEXANDER	98080136	29886	R	TROLL	30-Jul-98	31	3	NE	109	43120
SITKA	98030903	57431	R	TROLL	30-Jul-98	31	3	NW	113	43120
SITKA	98030914	57981	R	TROLL	30-Jul-98	31	3	NW	154	43120
SITKA	98030934	67113	R	TROLL	30-Jul-98	31	3			43120
SITKA	98030934	67079	R	TROLL	30-Jul-98	31	3			43120
SITKA	98030934	67134	R	TROLL	30-Jul-98	31	3			43120
SITKA	98030934	67119	R	TROLL	30-Jul-98	31	3			43120
SITKA	98030934	67145	R	TROLL	30-Jul-98	31	3			43120
SITKA	98030934	67139	R	TROLL	30-Jul-98	31	3			43120
YAKUTAT	98140045	45414	R	TROLL	30-Jul-98	31	3	NW	181	44334
SITKA	98030934	67127	R	TROLL	30-Jul-98	31	3			44334
EXCURSION INLET	98100047	52995	R	PURSE	30-Jul-98	31		NE	112	44813
PORT ALEXANDER	98080136	29889	R	TROLL	30-Jul-98	31	3	NE	109	44813
HOONAH	98110104	44864	R	TROLL	30-Jul-98	31	3	NW	113	44813
SITKA	98030915	57985	R	TROLL	30-Jul-98	31	3	NW	154	44813
SITKA	98030934	67143	R	TROLL	30-Jul-98	31	3			44813
SITKA	98030934	67133	R	TROLL	30-Jul-98	31	3			44813
SITKA	98030934	67144	R	TROLL	30-Jul-98	31	3			44813
SITKA	98030934	67080	R	TROLL	30-Jul-98	31	3			44813
SITKA	98030934	67109	R	TROLL	30-Jul-98	31	3			44813
SITKA	98030934	67068	R	TROLL	30-Jul-98	31	3			44813
SITKA	98030934	67098	R	TROLL	30-Jul-98	31	3			44813
SITKA	98030934	67105	R	TROLL	30-Jul-98	31	3			44813
SITKA	98030934	67124	R	TROLL	30-Jul-98	31	3			44813
SITKA	98030934	67135	R	TROLL	30-Jul-98	31	3			44813
SITKA	98030934	67102	R	TROLL	30-Jul-98	31	3			44938
PETERSBURG	98050578	25755	R	PURSE	31-Jul-98	31		NE		43120
KETCHIKAN	98060289	23539	R	TROLL	31-Jul-98	31	3	SE	101	43120
PORT ALEXANDER	98080143	29911	R	TROLL	31-Jul-98	31	3	NE	109	43120
SITKA	98030920	57349	R	TROLL	31-Jul-98	31	3	NW	113	43120
SITKA	98030928	67023	R	TROLL	31-Jul-98	31	3	NW	154	43120
EXCURSION INLET	98100057	53645	R	TROLL	31-Jul-98	31	3	NW		43120
SITKA	98030917	57334	R	TROLL	31-Jul-98	31	3	NW	113	44334
SITKA	98030929	67039	R	TROLL	31-Jul-98	31	3	NW	113	44334
SITKA	98030929	67028	R	TROLL	31-Jul-98	31	3	NW	113	44334
SITKA	98030926	67005	R	TROLL	31-Jul-98	31	3	NW	154	44334
PETERSBURG	98050581	25781	R	PURSE	31-Jul-98	31		NE	112	44813
PETERSBURG	98050585	25769	R	PURSE	31-Jul-98	31		NE	109	44813
PETERSBURG	98050586	25779	R	PURSE	31-Jul-98	31		NE	109	44813
PETERSBURG	98050585	25766	R	PURSE	31-Jul-98	31		NE	109	44813
PETERSBURG	98050583	25759	R	PURSE	31-Jul-98	31		NE	109	44813

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SURVEY SITE	SAMPLE NUM	HEAD	SAMPLE TYPE	GEAR CLASS	DATE	STAT WK	PERIOD	QUAD	DISTRICT	TAG CODE
PETERSBURG	98050583	25758	R	PURSE	31-Jul-98	31		NE	109	44813
PETERSBURG	98050592	25915	R	PURSE	31-Jul-98	31		NE	109	44813
PETERSBURG	98050584	25762	R	PURSE	31-Jul-98	31		NE	109	44813
PETERSBURG	98050592	25917	R	PURSE	31-Jul-98	31		NE	109	44813
PETERSBURG	98050576	24033	R	PURSE	31-Jul-98	31		NE	110	44813
PETERSBURG	98050579	25785	R	PURSE	31-Jul-98	31		NE		44813
PETERSBURG	98050578	25754	R	PURSE	31-Jul-98	31		NE		44813
PETERSBURG	98050596	28301	R	TROLL	31-Jul-98	31	3	SE	105	44813
SITKA	98030926	67016	R	TROLL	31-Jul-98	31	3	NW	154	44813
PETERSBURG	98050583	25757	R	PURSE	31-Jul-98	31		NE	109	44938
PORT ALEXANDER	98080147	29925	R	TROLL	1-Aug-98	31	3	NE	109	43120
PORT ALEXANDER	98080148	29929	R	TROLL	1-Aug-98	31	3	NE	109	43120
PORT ALEXANDER	98080149	29935	R	TROLL	1-Aug-98	31	3	NE	109	43120
PORT ALEXANDER	98080149	29936	R	TROLL	1-Aug-98	31	3	NE	109	43120
PORT ALEXANDER	98080151	29942	R	TROLL	1-Aug-98	31	3	NW	113	43120
SITKA	98030933	67060	R	TROLL	1-Aug-98	31	3	NW	113	43120
PORT ALEXANDER	98080151	29944	R	TROLL	1-Aug-98	31	3	NW	113	44813
SITKA	98030947	67427	S	TROLL	1-Aug-98	31	3			43120
HOONAH	98110113	44900	R	TROLL	2-Aug-98	32	3	NW	113	43120
SITKA	98030953	67460	R	TROLL	2-Aug-98	32	3			43120
SITKA	98030953	67464	R	TROLL	2-Aug-98	32	3			43120
SITKA	98030953	67187	R	TROLL	2-Aug-98	32	3			43120
SITKA	98030953	67200	R	TROLL	2-Aug-98	32	3			43120
HOONAH	98110113	44271	R	TROLL	2-Aug-98	32	3	NW	113	44334
SITKA	98030942	67504	R	TROLL	2-Aug-98	32	3	NW	113	44813
SITKA	98030938	67405	R	TROLL	2-Aug-98	32	3	NW	113	44813
HOONAH	98119996	44886	R	TROLL	2-Aug-98	32	3	NW	113	44813
HOONAH	98110113	44281	R	TROLL	2-Aug-98	32	3	NW	113	44813
SITKA	98030953	67176	R	TROLL	2-Aug-98	32	3			44813
SITKA	98030953	67182	R	TROLL	2-Aug-98	32	3			44813
SITKA	98030953	67193	R	TROLL	2-Aug-98	32	3			44813
SITKA	98030953	67175	R	TROLL	2-Aug-98	32	3			44813
SITKA	98030953	67179	R	TROLL	2-Aug-98	32	3			44938
SITKA	98030990	67354	S	TROLL	2-Aug-98	32	3	NW	113	44813
PETERSBURG	98050618	25939	R	PURSE	3-Aug-98	32		NE	109	43120
PETERSBURG	98050602	28320	R	PURSE	3-Aug-98	32		NE	109	43120
PETERSBURG	98050601	28322	R	PURSE	3-Aug-98	32		NE	109	43120
PETERSBURG	98050601	28321	R	PURSE	3-Aug-98	32		NE	109	43120
PETERSBURG	98050605	28311	R	PURSE	3-Aug-98	32		NE	109	43120
PETERSBURG	98050639	25940	R	PURSE	3-Aug-98	32		NE		43120
PORT ALEXANDER	98080157	29962	R	TROLL	3-Aug-98	32	3	NE	109	43120
SITKA	98030945	67415	R	TROLL	3-Aug-98	32	3	NW	113	43120
SITKA	98030950	67543	R	TROLL	3-Aug-98	32	3	NW	113	44320
YAKUTAT	98140048	45293	R	TROLL	3-Aug-98	32	3	NW	113	43120
YAKUTAT	98140048	45441	R	TROLL	3-Aug-98	32	3	NW	113	43120
YAKUTAT	98140048	45265	R	TROLL	3-Aug-98	32	3	NW	113	43120
EXCURSION INLET	98100062	53109	R	PURSE	3-Aug-98	32		NE	112	44813
PETERSBURG	98050615	25949	R	PURSE	3-Aug-98	32		NE	109	44813
PETERSBURG	98050609	25956	R	PURSE	3-Aug-98	32		NE	109	44813
PETERSBURG	98050608	25959	R	PURSE	3-Aug-98	32		NE	109	44813
PETERSBURG	98050619	25938	R	PURSE	3-Aug-98	32		NE	109	44813
PETERSBURG	98050605	28310	R	PURSE	3-Aug-98	32		NE	109	44813
PETERSBURG	98050628	25790	R	PURSE	3-Aug-98	32		NE	112	44813
SITKA	98030967	57450	R	TROLL	3-Aug-98	32	3	NW	113	44813
SITKA	98030967	57452	R	TROLL	3-Aug-98	32	3	NW	113	44813
SITKA	98030967	57469	R	TROLL	3-Aug-98	32	3	NW	113	44813
EXCURSION INLET	98100061	53199	R	TROLL	3-Aug-98	32	3	NW		44813
EXCURSION INLET	98100061	53226	R	TROLL	3-Aug-98	32	3	NW		44813
PETERSBURG	98050607	25748	R	PURSE	3-Aug-98	32		NE	109	44938
EXCURSION INLET	98100061	53174	R	TROLL	3-Aug-98	32	3	NW		44938
EXCURSION INLET	98100061	53173	R	TROLL	3-Aug-98	32	3	NW		44938
SITKA	98030989	67332	S	TROLL	3-Aug-98	32	3	NW	113	44813
CRAIG	98070354	16362	R	TROLL	4-Aug-98	32	3	SE	105	43120
CRAIG	98070346	16408	R	TROLL	4-Aug-98	32	3	SE	105	43120
HOONAH	98110123	44669	R	TROLL	4-Aug-98	32	3	NW	113	43120
SITKA	98030952	67161	R	TROLL	4-Aug-98	32	3	NW	154	43120
SITKA	98030952	67171	R	TROLL	4-Aug-98	32	3	NW	154	43120
SITKA	98030957	67440	R	TROLL	4-Aug-98	32	3	NW	113	44813
SITKA	98030956	67217	R	TROLL	4-Aug-98	32	3	NW	113	44938
SITKA	98030984	67287	S	TROLL	4-Aug-98	32	3			43120
SITKA	98030984	67286	S	TROLL	4-Aug-98	32	3			44813
PETERSBURG	98050677	28406	R	TROLL	5-Aug-98	32	3	NE	109	43120
PETERSBURG	98050677	26050	R	TROLL	5-Aug-98	32	3	NE	109	43120
SITKA	98030974	67253	R	TROLL	5-Aug-98	32	3	NW	113	43120
SITKA	98030974	67249	R	TROLL	5-Aug-98	32	3	NW	113	43120
SITKA	98030978	67577	R	TROLL	5-Aug-98	32	3	NW	154	43120
SITKA	98030968	57479	R	TROLL	5-Aug-98	32	3			43120
PETERSBURG	98050683	25987	R	PURSE	5-Aug-98	32		NE	109	44813
PETERSBURG	98050677	28429	R	TROLL	5-Aug-98	32	3	NE	109	44813
PETERSBURG	98050677	28407	R	TROLL	5-Aug-98	32	3	NE	109	44813
PETERSBURG	98050677	28404	R	TROLL	5-Aug-98	32	3	NE	109	44813
SITKA	98030980	67614	R	TROLL	5-Aug-98	32	3	NW	113	44813
SITKA	98030976	67266	R	TROLL	5-Aug-98	32	3	NW	154	44813
HOONAH	98110121	44650	R	TROLL	5-Aug-98	32	3	NW		44813
SITKA	98030968	57481	R	TROLL	5-Aug-98	32	3			44813

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SURVEY SITE	SAMPLE NUM	HEAD	SAMPLE TYPE	GEAR CLASS	DATE	STAT WEEK	PERIOD	QUAD	DISTRICT	TAG CODE
SITKA	98030968	57477	R	TROLL	5-Aug-98	32	3			44813
PETERSBURG	98050683	25988	R	PURSE	5-Aug-98	32		NE	109	44938
SITKA	98030974	67250	R	TROLL	5-Aug-98	32	3	NW	113	44938
SITKA	98030985	67312	S	TROLL	5-Aug-98	32	3			44813
CRAIG	98070377	16297	R	TROLL	6-Aug-98	32	3	SE	105	43120
PETERSBURG	98050686	28474	R	TROLL	6-Aug-98	32	3	NE	109	43120
EXCURSION INLET	98100070	53292	R	TROLL	6-Aug-98	32	3	NW		43120
SITKA	98030996	67646	R	TROLL	6-Aug-98	32	3	NW		43120
PORT ALEXANDER	98080163	29980	R	TROLL	6-Aug-98	32	3			43120
SITKA	98031017	67783	R	TROLL	6-Aug-98	32	3			43120
SITKA	98031017	67797	R	TROLL	6-Aug-98	32	3			43120
SITKA	98031017	67791	R	TROLL	6-Aug-98	32	3			43120
SITKA	98031017	67788	R	TROLL	6-Aug-98	32	3			43120
SITKA	98031017	67843	R	TROLL	6-Aug-98	32	3			43120
PORT ALEXANDER	98080163	29981	R	TROLL	6-Aug-98	32	3			44334
SITKA	98031017	67873	R	TROLL	6-Aug-98	32	3			44334
SITKA	98031017	67852	R	TROLL	6-Aug-98	32	3			44334
SITKA	98031017	67835	R	TROLL	6-Aug-98	32	3			44334
EXCURSION INLET	98100069	53267	R	PURSE	6-Aug-98	32		NE	112	44813
PETERSBURG	98050686	28465	R	TROLL	6-Aug-98	32	3	NE	109	44813
PETERSBURG	98050686	28469	R	TROLL	6-Aug-98	32	3	NE	109	44813
SITKA	98030995	67641	R	TROLL	6-Aug-98	32	3	NW	113	44813
SITKA	98030983	67271	R	TROLL	6-Aug-98	32	3	NW	113	44813
EXCURSION INLET	98100070	53291	R	TROLL	6-Aug-98	32	3	NW		44813
SITKA	98031017	67864	R	TROLL	6-Aug-98	32	3			44813
SITKA	98031017	67795	R	TROLL	6-Aug-98	32	3			44813
SITKA	98031017	67812	R	TROLL	6-Aug-98	32	3			44813
SITKA	98031017	67837	R	TROLL	6-Aug-98	32	3			44813
SITKA	98031017	67801	R	TROLL	6-Aug-98	32	3			44813
SITKA	98031017	67823	R	TROLL	6-Aug-98	32	3			44813
SITKA	98031017	67842	R	TROLL	6-Aug-98	32	3			44813
SITKA	98031017	67806	R	TROLL	6-Aug-98	32	3			44813
SITKA	98035340	39050	R	SPORT	6-Aug-98	32		NW	113	44813
EXCURSION INLET	98100070	53296	R	TROLL	6-Aug-98	32	3	NW		44938
EXCURSION INLET	98100070	53335	R	TROLL	6-Aug-98	32	3	NW		44938
SITKA	98031017	67870	R	TROLL	6-Aug-98	32	3			44938
SITKA	98031017	67822	R	TROLL	6-Aug-98	32	3			44938
SITKA	98030998	67393	S	TROLL	6-Aug-98	32	3	NW	113	43120
SITKA	98030998	67709	S	TROLL	6-Aug-98	32	3	NW	113	43120
SITKA	98030998	67718	S	TROLL	6-Aug-98	32	3	NW	113	44813
SITKA	98030998	67721	S	TROLL	6-Aug-98	32	3	NW	113	44813
PORT ALEXANDER	98080165	29997	R	TROLL	7-Aug-98	32	3	NE	109	43120
PORT ALEXANDER	98080164	29982	R	TROLL	7-Aug-98	32	3	NE	109	43120
PORT ALEXANDER	98080165	29991	R	TROLL	7-Aug-98	32	3	NE	109	43120
SITKA	98031002	67738	R	TROLL	7-Aug-98	32	3	NW	154	44334
PETERSBURG	98050699	28344	R	PURSE	7-Aug-98	32		NE	109	44813
PETERSBURG	98050696	28330	R	PURSE	7-Aug-98	32		NE	109	44813
PORT ALEXANDER	98080164	29989	R	TROLL	7-Aug-98	32	3	NE	109	44813
PORT ALEXANDER	98080165	29994	R	TROLL	7-Aug-98	32	3	NE	109	44813
PORT ALEXANDER	98080166	84012	R	TROLL	7-Aug-98	32	3	NE	109	44813
SITKA	98031008	67498	R	TROLL	7-Aug-98	32	3	NW	113	44813
SITKA	98031005	67749	R	TROLL	7-Aug-98	32	3	NW	154	44813
SITKA	98031010	67911	R	TROLL	7-Aug-98	32	3	NW	113	44938
PETERSBURG	98050717	28381	R	PURSE	8-Aug-98	32		SW	104	44334
EXCURSION INLET	98100074	35318	R	TROLL	8-Aug-98	32	3	NW		44813
SITKA	98031037	67876	R	TROLL	9-Aug-98	33	3	NE	109	43120
PORT ALEXANDER	98080168	84023	R	TROLL	9-Aug-98	33	3	NE	109	43120
SITKA	98031037	57507	R	TROLL	9-Aug-98	33	3	NE	109	43120
SITKA	98031037	67890	R	TROLL	9-Aug-98	33	3	NE	109	43120
SITKA	98031021	67958	R	TROLL	9-Aug-98	33	3	NW	113	43120
PORT ALEXANDER	98080171	84036	R	TROLL	9-Aug-98	33	3	NE	109	44334
SITKA	98031037	67892	R	TROLL	9-Aug-98	33	3	NE	109	44334
SITKA	98031037	67880	R	TROLL	9-Aug-98	33	3	NE	109	44813
PORT ALEXANDER	98080177	84050	R	TROLL	10-Aug-98	33	3	NE	109	43120
SITKA	98031027	67971	R	TROLL	10-Aug-98	33	3	NW	113	43120
SITKA	98031025	57499	R	TROLL	10-Aug-98	33	3	NW	113	43120
HOONAH	98110141	44710	R	TROLL	10-Aug-98	33	3	NW	113	43120
HOONAH	98110141	44713	R	TROLL	10-Aug-98	33	3	NW	113	43120
ELFIN COVE	98020241	50733	R	TROLL	10-Aug-98	33	3	NW	114	44334
PETERSBURG	98050725	28531	R	TROLL	10-Aug-98	33	3			44334
SITKA	98031027	67973	R	TROLL	10-Aug-98	33	3	NW	113	44813
SITKA	98031025	57497	R	TROLL	10-Aug-98	33	3	NW	113	44813
HOONAH	98110142	44717	R	TROLL	10-Aug-98	33	3	NW	116	44813
SITKA	98035391	39109	R	SPORT	10-Aug-98	33		NW	113	44813
PORT ALEXANDER	98080176	84046	R	TROLL	10-Aug-98	33	3	NE	109	44938
SITKA	98031026	68305	R	TROLL	10-Aug-98	33	3	NW	113	44938
PETERSBURG	98050752	28584	R	PURSE	11-Aug-98	33		NE	109	43120
PETERSBURG	98050730	28626	R	TROLL	11-Aug-98	33	3	NE	109	43120
PETERSBURG	98050732	28607	R	TROLL	11-Aug-98	33	3	NE	109	43120
SITKA	98031036	67676	R	TROLL	11-Aug-98	33	3	NW	113	43120
HOONAH	98110147	85003	R	TROLL	11-Aug-98	33	3	NW	114	43120
PETERSBURG	98050731	28620	R	TROLL	11-Aug-98	33	3	NE	109	44334
PETERSBURG	98050746	28557	R	PURSE	11-Aug-98	33		NE	109	44813
PETERSBURG	98050751	28576	R	PURSE	11-Aug-98	33		NE	109	44813
PETERSBURG	98050757	28586	R	PURSE	11-Aug-98	33		NE		44813

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SURVEY SITE	SAMPLE NUM	HEAD	SAMPLE TYPE	GEAR CLASS	DATE	STAT WEEK	PERIOD	QUAD	DISTRICT	TAG CODE
PORT ALEXANDER	98080178	84054	R	TROLL	11-Aug-98	33	3	NE	109	44813
PELICAN	98010088	37601	R	TROLL	11-Aug-98	33	3	NW	113	44813
PELICAN	98010084	37569	R	TROLL	11-Aug-98	33	3	NW		44813
SITKA	98031045	68247	S	TROLL	11-Aug-98	33	3			43120
SITKA	98031045	68254	S	TROLL	11-Aug-98	33	3			43120
PETERSBURG	98050795	28644	R	TROLL	12-Aug-98	33	3	SE	105	43120
SITKA	98031049	57529	R	TROLL	12-Aug-98	33	3	NE	109	43120
SITKA	98031059	68513	R	TROLL	12-Aug-98	33	3	NW	113	43120
SITKA	98031051	57551	R	TROLL	12-Aug-98	33	3	NW		44334
SITKA	98031049	57540	R	TROLL	12-Aug-98	33	3	NE	109	44813
SITKA	98031062	68521	R	TROLL	12-Aug-98	33	3	NW	113	44813
JUNEAU	98040037	10017	R	TROLL	12-Aug-98	33	3	NW		44813
SITKA	98035416	39366	R	SPORT	12-Aug-98	33		NW	113	44813
PETERSBURG	98050793	28541	R	TROLL	12-Aug-98	33	3	NE	109	44938
YAKUTAT	98140066	45601	S	TROLL	12-Aug-98	33	3	NW		43120
HOONAH	98110159	85046	S	TROLL	12-Aug-98	33	3	NW	113	44334
JUNEAU	98040038	10216	R	TROLL	13-Aug-98	33	3	NE	109	43120
JUNEAU	98040038	10215	R	TROLL	13-Aug-98	33	3	NE	109	43120
JUNEAU	98040038	10209	R	TROLL	13-Aug-98	33	3	NE	109	43120
PETERSBURG	98050800	28724	R	TROLL	13-Aug-98	33	3	NE	109	43120
PETERSBURG	98050807	28495	R	PURSE	13-Aug-98	33		NE	109	44334
JUNEAU	98040038	10210	R	TROLL	13-Aug-98	33	3	NE	109	44334
PETERSBURG	98050807	28498	R	PURSE	13-Aug-98	33		NE	109	44813
PETERSBURG	98050807	28497	R	PURSE	13-Aug-98	33		NE	109	44813
JUNEAU	98040038	10207	R	TROLL	13-Aug-98	33	3	NE	109	44813
JUNEAU	98040038	10217	R	TROLL	13-Aug-98	33	3	NE	109	44813
JUNEAU	98040038	10218	R	TROLL	13-Aug-98	33	3	NE	109	44813
PETERSBURG	98050801	28725	R	TROLL	13-Aug-98	33	3	NE	109	44813
JUNEAU	98040038	10214	R	TROLL	13-Aug-98	33	3	NE	109	44813
JUNEAU	98040038	10208	R	TROLL	13-Aug-98	33	3	NE	109	44813
EXCURSION INLET	98100081	53438	R	TROLL	13-Aug-98	33	3	NW		44813
EXCURSION INLET	98100081	53441	R	TROLL	13-Aug-98	33	3	NW		44813
SITKA	98031075	68710	S	TROLL	13-Aug-98	33	3	NW	154	43120
SITKA	98031075	68737	S	TROLL	13-Aug-98	33	3	NW	154	43120
SITKA	98031075	68758	S	TROLL	13-Aug-98	33	3	NW	154	43120
SITKA	98031075	68735	S	TROLL	13-Aug-98	33	3	NW	154	44813
SITKA	98031075	68744	S	TROLL	13-Aug-98	33	3	NW	154	44813
SITKA	98031078	68194	S	TROLL	14-Aug-98	33	3	NW	189	44813
PETERSBURG	98050839	28671	R	PURSE	15-Aug-98	33		NE	109	43120
PETERSBURG	98050839	28676	R	PURSE	15-Aug-98	33		NE	109	43120
PETERSBURG	98050828	28657	R	PURSE	15-Aug-98	33		NE	109	43120
PETERSBURG	98050818	28863	R	PURSE	15-Aug-98	33		NE	109	43120
PETERSBURG	98050832	28855	R	PURSE	15-Aug-98	33		NE	109	44334
SITKA	98035385	39080	R	SPORT	15-Aug-98	33		NW	113	44334
PETERSBURG	98050830	28853	R	PURSE	15-Aug-98	33		NE	109	44813
PETERSBURG	98050839	28678	R	PURSE	15-Aug-98	33		NE	109	44813
PETERSBURG	98050839	28670	R	PURSE	15-Aug-98	33		NE	109	44813
PETERSBURG	98050832	28856	R	PURSE	15-Aug-98	33		NE	109	44813
PETERSBURG	98050826	28659	R	PURSE	15-Aug-98	33		NE	109	44813
PETERSBURG	98050839	28668	R	PURSE	15-Aug-98	33		NE	109	44813
PETERSBURG	98050819	28742	R	PURSE	15-Aug-98	33		NE	109	44813
PETERSBURG	98050819	28737	R	PURSE	15-Aug-98	33		NE	109	44813
SITKA	98035426	39391	R	SPORT	16-Aug-98	34		NW	113	44334
PETERSBURG	98050843	28696	R	PURSE	17-Aug-98	34		NE	109	44813
SITKA	98035458	39142	R	SPORT	17-Aug-98	34		NW	113	44813
PETERSBURG	98050885	70780	R	PURSE	18-Aug-98	34		NE	109	44813
PETERSBURG	98050885	70781	R	PURSE	18-Aug-98	34		NE	109	44813
PETERSBURG	98050885	70778	R	PURSE	18-Aug-98	34		NE	109	44813
PETERSBURG	98050870	28894	R	PURSE	19-Aug-98	34		NE	109	43120
PETERSBURG	98050873	70806	R	PURSE	19-Aug-98	34		NE	109	44813
PETERSBURG	98050871	70901	R	PURSE	19-Aug-98	34		NE	109	44813
PETERSBURG	98050871	70908	R	PURSE	19-Aug-98	34		NE	109	44813
PETERSBURG	98050868	70821	R	PURSE	19-Aug-98	34		NE	109	44813
PETERSBURG	98050870	28890	R	PURSE	19-Aug-98	34		NE	109	44813
PETERSBURG	98050881	28881	R	PURSE	19-Aug-98	34		NE	109	44813
EXCURSION INLET	98100089	35838	R	PURSE	20-Aug-98	34		NE	112	44938
PORT ALEXANDER	98080182	84070	R	TROLL	22-Aug-98	34	4	NE	109	43120
PORT ALEXANDER	98080185	84083	R	TROLL	22-Aug-98	34	4	NE	109	43120
PORT ALEXANDER	98080185	84082	R	TROLL	22-Aug-98	34	4	NE	109	43120
PORT ALEXANDER	98080183	84071	R	TROLL	22-Aug-98	34	4	NE	109	44334
PORT ALEXANDER	98080184	84078	R	TROLL	22-Aug-98	34	4	NE	109	44813
PORT ALEXANDER	98080184	84076	R	TROLL	22-Aug-98	34	4	NE	109	44813
PORT ALEXANDER	98080186	84087	R	TROLL	22-Aug-98	34	4	NW	113	44813
PETERSBURG	98050938	14906	R	PURSE	22-Aug-98	34		NE	109	44938
PORT ALEXANDER	98080184	84080	R	TROLL	22-Aug-98	34	4	NE	109	44938
PETERSBURG	98050924	28786	R	PURSE	23-Aug-98	35		NE	109	43120
SITKA	98031137	68975	R	TROLL	23-Aug-98	35	4	NE	109	43120
SITKA	98031137	68436	R	TROLL	23-Aug-98	35	4	NE	109	43120
PORT ALEXANDER	98080192	84131	R	TROLL	23-Aug-98	35	4	NE	109	43120
SITKA	98031137	68981	R	TROLL	23-Aug-98	35	4	NE	109	43120
SITKA	98031137	68992	R	TROLL	23-Aug-98	35	4	NE	109	43120
SITKA	98031137	68447	R	TROLL	23-Aug-98	35	4	NE	109	43120
SITKA	98031154	69022	R	TROLL	23-Aug-98	35	4	NE	109	43120
SITKA	98031154	69030	R	TROLL	23-Aug-98	35	4	NE	109	43120
SITKA	98031154	69008	R	TROLL	23-Aug-98	35	4	NE	109	43120

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SURVEY SITE	SAMPLE NUM	HEAD	SAMPLE TYPE	GEAR CLASS	DATE	STAT WEEK	PERIOD	QUAD	DISTRICT	TAG CODE
PETERSBURG	98050933	28791	R	PURSE	23-Aug-98	35		NE	112	44334
SITKA	98031137	68449	R	TROLL	23-Aug-98	35	4	NE	109	44334
PORT ALEXANDER	98080189	84104	R	TROLL	23-Aug-98	35	4	NE	109	44334
SITKA	98031136	68419	R	TROLL	23-Aug-98	35	4	NW	113	44334
PETERSBURG	98050924	28787	R	PURSE	23-Aug-98	35		NE	109	44813
PETERSBURG	98050924	28784	R	PURSE	23-Aug-98	35		NE	109	44813
PETERSBURG	98050924	28782	R	PURSE	23-Aug-98	35		NE	109	44813
PETERSBURG	98050927	14905	R	PURSE	23-Aug-98	35		NE	109	44813
PETERSBURG	98050935	70796	R	PURSE	23-Aug-98	35		NE	112	44813
PORT ALEXANDER	98080192	84133	R	TROLL	23-Aug-98	35	4	NE	109	44813
SITKA	98031137	68450	R	TROLL	23-Aug-98	35	4	NE	109	44813
SITKA	98031137	68976	R	TROLL	23-Aug-98	35	4	NE	109	44813
SITKA	98031137	68967	R	TROLL	23-Aug-98	35	4	NE	109	44938
SITKA	98031137	68966	R	TROLL	23-Aug-98	35	4	NE	109	44938
PETERSBURG	98050947	70938	R	TROLL	24-Aug-98	35	4	NE	109	43120
PETERSBURG	98050947	70936	R	TROLL	24-Aug-98	35	4	NE	109	44334
KETCHIKAN	98060448	27916	R	TROLL	24-Aug-98	35	4	SE	101	44813
SITKA	98031118	68330	R	TROLL	24-Aug-98	35	4	NW	113	44813
PETERSBURG	98050978	18164	R	TROLL	26-Aug-98	35	4	NE	109	44334
PETERSBURG	98050962	18159	R	TROLL	26-Aug-98	35	4	NE	109	44334
PETERSBURG	98050954	14917	R	PURSE	26-Aug-98	35		NE	109	44813
PETERSBURG	98050954	14913	R	PURSE	26-Aug-98	35		NE	109	44813
PETERSBURG	98050954	14915	R	PURSE	26-Aug-98	35		NE	109	44813
PETERSBURG	98050978	18167	R	TROLL	26-Aug-98	35	4	NE	109	44813
PETERSBURG	98050978	18165	R	TROLL	26-Aug-98	35	4	NE	109	44813
PETERSBURG	98050962	18157	R	TROLL	26-Aug-98	35	4	NE	109	44813
SITKA	98031157	69048	R	TROLL	26-Aug-98	35	4	NW	113	44813
SITKA	98035512	80203	R	SPORT	26-Aug-98	35		NW	113	44813
PORT ALEXANDER	98080196	84148	R	TROLL	26-Aug-98	35	4	NE	109	44938
SITKA	98031166	69083	S	TROLL	26-Aug-98	35				43120
PETERSBURG	98051003	14972	R	PURSE	27-Aug-98	35		NE	109	43120
SITKA	98031190	69387	R	TROLL	27-Aug-98	35	4	NE	109	43120
SITKA	98031190	69389	R	TROLL	27-Aug-98	35	4	NE	109	43120
SITKA	98031190	69391	R	TROLL	27-Aug-98	35	4	NE	109	43120
SITKA	98031190	69394	R	TROLL	27-Aug-98	35	4	NE	109	43120
SITKA	98031190	123531	R	TROLL	27-Aug-98	35	4	NE	109	43120
SITKA	98031190	69396	R	TROLL	27-Aug-98	35	4	NE	109	43120
PETERSBURG	98050995	14941	R	PURSE	27-Aug-98	35		NE	109	44813
PETERSBURG	98050987	14981	R	PURSE	27-Aug-98	35		NE	112	44813
SITKA	98031190	69395	R	TROLL	27-Aug-98	35	4	NE	109	44813
SITKA	98031190	69385	R	TROLL	27-Aug-98	35	4	NE	109	44813
PELICAN	98010116	37790	R	TROLL	27-Aug-98	35	4	NW	113	44813
YAKUTAT	98140077	45635	R	TROLL	27-Aug-98	35	4	NW	189	44813
SITKA	98031190	69400	R	TROLL	27-Aug-98	35	4	NE	109	44938
CRAIG	98070476	43790	R	TROLL	28-Aug-98	35	4	SE	105	43120
PETERSBURG	98051012	62532	R	TROLL	28-Aug-98	35	4			43120
PETERSBURG	98051012	62519	R	TROLL	28-Aug-98	35	4			43120
PETERSBURG	98051012	62537	R	TROLL	28-Aug-98	35	4			43120
SITKA	98031169	68475	R	TROLL	28-Aug-98	35	4	NW	154	44813
PETERSBURG	98051012	62527	R	TROLL	28-Aug-98	35	4			44813
PETERSBURG	98051012	62522	R	TROLL	28-Aug-98	35	4			44813
PORT ALEXANDER	98080208	84177	R	TROLL	29-Aug-98	35	4	NE	109	44813
HOONAH	98110215	85633	R	TROLL	30-Aug-98	36	4	NE	109	44813
PETERSBURG	98051023	64022	R	PURSE	31-Aug-98	36		NE	109	43120
SITKA	98031196	69126	R	TROLL	31-Aug-98	36	4	NW	113	43120
PETERSBURG	98051026	14997	R	PURSE	31-Aug-98	36		NE	109	44938
SITKA	98031212	123590	R	TROLL	1-Sep-98	36	4	NW	113	43120
HOONAH	98110226	85569	R	TROLL	1-Sep-98	36	4	NW	114	44813
SITKA	98031230	69157	R	TROLL	4-Sep-98	36	4	NW	113	43120
KAKE	98270022	47059	R	DRIFT	4-Sep-98	36		SE	106	44813
SITKA	98031229	69153	R	TROLL	4-Sep-98	36	4	NW	113	44813
EXCURSION INLET	98100103	53367	R	TROLL	7-Sep-98	37	4	NW		44813
SITKA	98031286	125419	R	TROLL	10-Sep-98	37	4	NW	113	44813
SITKA	98031314	125463	R	TROLL	11-Sep-98	37	4	NW	113	43120
SITKA	98031308	125312	R	TROLL	11-Sep-98	37	4	NW	113	44813
SITKA	98031316	125474	R	TROLL	11-Sep-98	37	4	NW	113	44813
SITKA	98031332	125851	S	TROLL	11-Sep-98	37	4	NW	189	44813
SITKA	98031345	112956	R	TROLL	16-Sep-98	38	4	NW	113	44813
SITKA	98031406	125887	S	TROLL	19-Sep-98	38	4	NW	113	43120
SITKA	98031406	125898	S	TROLL	19-Sep-98	38	4	NW	113	44334
SITKA	98031406	123902	S	TROLL	19-Sep-98	38	4	NW	113	44813
SITKA	98031406	123906	S	TROLL	19-Sep-98	38	4	NW	113	44813

Appendix A2.—Daily counts of adult coho salmon with and without adipose finclips immigrating past the Slippery Creek adult weir in 1998.

Date	Daily count of large coho ^a	Cumulative count of large coho ^a	Daily adipose finclips	Cumulative adipose finclips	Percent adipose clipped
1 Sep	0	0	0	0	0
2 Sep	0	0	0	0	0
3 Sep	2	2	1	1	50
4 Sep	35	37	22	23	62
5 Sep	32	69	24	47	68
6 Sep	34	103	25	72	70
7 Sep	9	112	7	79	71
8 Sep	0	112	0	79	71
9 Sep	15	127	9	88	69
10 Sep	0	127	0	88	69
11 Sep	31	158	23	111	70
12 Sep	6	164	5	116	71
13 Sep	19	183	15	131	72
14 Sep	6	189	4	135	71
15 Sep	0	189	0	135	71
16 Sep	0	189	0	135	71
17 Sep	0	189	0	135	71
18 Sep	0	189	0	135	71
19 Sep	0	189	0	135	71
20 Sep	0	189	0	135	71
21 Sep	2	191	2	137	72
22 Sep	0	191	0	137	72
23 Sep	0	191	0	137	72
24 Sep	2	193	2	139	72
25 Sep	0	193	0	139	72
26 Sep	0	193	0	139	72
27 Sep	0	193	0	139	72
28 Sep	0	193	0	139	72
29 Sep	0	193	0	139	72
30 Sep	22	215	20	159	74
1 Oct	79	294	54	213	72
2 Oct	114	408	87	300	74
3 Oct	5	413	4	304	74
4 Oct	0	413	0	304	74
5 Oct	72	485	47	351	72
6 Oct	41	526	37	388	74
7 Oct	46	572	39	427	75
8 Oct	32	604	28	455	75
9 Oct	5	609	5	460	76
10 Oct	0	609	0	460	76
11 Oct	0	609	0	460	76
12 Oct	0	609	0	460	76
13 Oct	0	609	0	460	76
14 Oct	0	609	0	460	76
15 Oct	0	609	0	460	76
16 Oct	4	613	4	464	76
17 Oct	2	615	2	466	76
18 Oct	8	623 ^b	7	473	76

^a >16 inches total length.

^b Another 9 adult unmarked coho were caught above the weir site after the weir was fish tight, for a total escapement of 632 fish.

Appendix A3.—Computer data files on 1997 Slippery Creek coho salmon smolt and subsequent estimates of 1998 Slippery Creek adult coho salmon run parameters.

File name	Description
SLIP9798MODEL.XLS	Excel spreadsheet computing smolt production, marine harvest, exploitation, and marine survival.
SLIP9798CWT.TXT	Raw Slippery Creek coho contribution data downloaded from tag lab database.
SLIPADULT98AGE.TXT	Age and length summary of the 1998 adult return.